



SEQUENCE LISTING

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Cress, Dean Ervin

<120> Ecdysone Receptor-Based Inducible Gene Expression System

<130> A01020B

<140> US 09/965,703

<141> 2001-09-26

<150> US 60/191,355

<151> 2000-03-22

<150> US 60/269,799

<151> 2001-02-20

<160> 78

<170> PatentIn version 3.3

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| gcgaacaacc aagcgtacac tcgcgacaac taccgcaagg ctggcatggc ctacgtcatc | 720 |
| gaggatctac tgcacttctg ccggtgcatg tactctatgg cgttggacaa catccattac | 780 |
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| attgttgagt | ttgctaaagg | tctaccagcg | tttaciaaaga | taccccagga | ggaccagatc | 720 |
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| atgaagggtg | acaacgtcga | atacgcgctt | ctcactgcca | ttgtgatctt | ctcggaccgg | 960 |
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| gccgttaccg | ctagctccac | cacatcagcg | gtaccgatgg | gcaacggagt | tgagtcgggt | 1740 |
| gttgggggtg | gcggcaacgt | cagcatgtat | gcgaacgccc | agacggcgat | ggccttgatg | 1800 |
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| atgaccactt | cgccgagctc | tcagcatggc | ggcaatggca | gcttggcctc | tggtggcggc | 240 |
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| gtgggcgga acgtcagcat gtatgcgaac gccagacgg cgatggcctt gatgggtgta | 1680 |
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| ttggcctctg gtggcgcca agactttgtt aagaaggaga ttcttgacct tatgacatgc | 180 |

| | |
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| gatgagaacg agagccaaac ggacgtcagc tttcggcata taaccgagat aaccatactc | 420 |
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 <212> DNA
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| attgttgagt ttgctaaagg tctaccagcg tttaaaaga taccacagga ggaccagatc | 180 |
| acgttactaa aggctgctc gtcggagggtg atgatgctgc gtatggcacg acgctatgac | 240 |

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| atggccggaa | tggctgataa | cattgaagac | ctgctgcatt | tctgccgcca | aatgttctcg | 360 |
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| cagacgcaac | tccagccaca | gattcaacca | cagccacagc | tccttcccgt | ctccgctccc | 1020 |
| gtgcccgcct | ccgtaaccgc | acctggttcc | ttgtccgcgg | tcagtacgag | cagcgaatac | 1080 |
| atgggcccga | gtgcggccat | aggacccatc | acgccggcaa | ccaccagcag | tatcacggct | 1140 |
| gccgttaccg | ctagctccac | cacatcagcg | gtaccgatgg | gcaacggagt | tggagtcggg | 1200 |
| gttgggggtg | gcggcaacgt | cagcatgtat | gcgaacgccc | agacggcgat | ggccttgatg | 1260 |
| ggtgtagccc | tgcattcgca | ccaagagcag | cttatcgggg | gagtggcggt | taagtcggag | 1320 |
| cactcgacga | ctgcatag | | | | | 1338 |

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 <211> 969
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 <213> *Drosophila melanogaster*

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| cagaaggaga | aggacaaaat | gaccacttcg | ccgagctctc | agcatggcgg | caatggcagc | 120 |
| ttggcctctg | gtggcggcca | agactttgtt | aagaaggaga | ttcttgacct | tatgacatgc | 180 |
| gagccgcccc | agcatgccac | tattccgcta | ctacctgatg | aaatattggc | caagtgtcaa | 240 |
| gcgcgcaata | taccttcctt | aacgtacaat | cagttggccg | ttatatacaa | gttaatttgg | 300 |
| taccaggatg | gctatgagca | gccatctgaa | gaggatctca | ggcgtataat | gagtcaaccc | 360 |
| gatgagaacg | agagccaaac | ggacgtcagc | tttcggcata | taaccgagat | aaccatactc | 420 |
| acggtccagt | tgattgttga | gtttgctaaa | ggtctaccag | cgtttataaa | gataccccag | 480 |
| gaggaccaga | tcacgttact | aaaggcctgc | tcgtcggagg | tgatgatgct | gcgtatggca | 540 |

cgacgctatg accacagctc ggactcaata ttcttcgcga ataatagatc atatacgcg 600
gattcttaca aaatggccgg aatggctgat aacattgaag acctgctgca ttcttgccgc 660
caaatgttct cgatgaaggt ggacaacgtc gaatacgcg ttctcactgc cattgtgatc 720
ttctcggacc ggccgggcct ggagaaggcc caactagtcg aagcgatcca gagctactac 780
atcgacacgc tacgcattta tatactcaac cgccactgcg gcgactcaat gagcctcgtc 840
ttctacgcaa agctgctctc gatcctcacc gagctgcgta cgctgggcaa ccagaacgcc 900
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tgggacgtt 969

<210> 11
<211> 412
<212> PRT
<213> Choristoneura fumiferana

<400> 11

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Asp Arg Ala Ser Gly Tyr His Tyr Asn Ala Leu Thr Cys Glu Gly Cys
20 25 30

Lys Gly Phe Phe Arg Arg Ser Val Thr Lys Asn Ala Val Tyr Ile Cys
35 40 45

Lys Phe Gly His Ala Cys Glu Met Asp Met Tyr Met Arg Arg Lys Cys
50 55 60

Gln Glu Cys Arg Leu Lys Lys Cys Leu Ala Val Gly Met Arg Pro Glu
65 70 75 80

Cys Val Val Pro Glu Thr Gln Cys Ala Met Lys Arg Lys Glu Lys Lys
85 90 95

Ala Gln Lys Glu Lys Asp Lys Leu Pro Val Ser Thr Thr Thr Val Asp
100 105 110

Asp His Met Pro Pro Ile Met Gln Cys Glu Pro Pro Pro Pro Glu Ala
115 120 125

Ala Arg Ile His Glu Val Val Pro Arg Phe Leu Ser Asp Lys Leu Leu
130 135 140

Glu Thr Asn Arg Gln Lys Asn Ile Pro Gln Leu Thr Ala Asn Gln Gln
145 150 155 160

Phe Leu Ile Ala Arg Leu Ile Trp Tyr Gln Asp Gly Tyr Glu Gln Pro
 165 170 175
 Ser Asp Glu Asp Leu Lys Arg Ile Thr Gln Thr Trp Gln Gln Ala Asp
 180 185 190
 Asp Glu Asn Glu Glu Ser Asp Thr Pro Phe Arg Gln Ile Thr Glu Met
 195 200 205
 Thr Ile Leu Thr Val Gln Leu Ile Val Glu Phe Ala Lys Gly Leu Pro
 210 215 220
 Gly Phe Ala Lys Ile Ser Gln Pro Asp Gln Ile Thr Leu Leu Lys Ala
 225 230 235 240
 Cys Ser Ser Glu Val Met Met Leu Arg Val Ala Arg Arg Tyr Asp Ala
 245 250 255
 Ala Ser Asp Ser Val Leu Phe Ala Asn Asn Gln Ala Tyr Thr Arg Asp
 260 265 270
 Asn Tyr Arg Lys Ala Gly Met Ala Tyr Val Ile Glu Asp Leu Leu His
 275 280 285
 Phe Cys Arg Cys Met Tyr Ser Met Ala Leu Asp Asn Ile His Tyr Ala
 290 295 300
 Leu Leu Thr Ala Val Val Ile Phe Ser Asp Arg Pro Gly Leu Glu Gln
 305 310 315 320
 Pro Gln Leu Val Glu Glu Ile Gln Arg Tyr Tyr Leu Asn Thr Leu Arg
 325 330 335
 Ile Tyr Ile Leu Asn Gln Leu Ser Gly Ser Ala Arg Ser Ser Val Ile
 340 345 350
 Tyr Gly Lys Ile Leu Ser Ile Leu Ser Glu Leu Arg Thr Leu Gly Met
 355 360 365
 Gln Asn Ser Asn Met Cys Ile Ser Leu Lys Leu Lys Asn Arg Lys Leu
 370 375 380
 Pro Pro Phe Leu Glu Glu Ile Trp Asp Val Ala Asp Met Ser His Thr
 385 390 395 400
 Gln Pro Pro Pro Ile Leu Glu Ser Pro Thr Asn Leu
 405 410

<210> 12
 <211> 412
 <212> PRT
 <213> Choristoneura fumiferana

<400> 12

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 1 5 10 15

Asp Arg Ala Ser Gly Tyr His Tyr Asn Ala Leu Thr Cys Glu Gly Cys
 20 25 30

Lys Gly Phe Phe Arg Arg Ser Val Thr Lys Asn Ala Val Tyr Ile Cys
 35 40 45

Lys Phe Gly His Ala Cys Glu Met Asp Met Tyr Met Arg Arg Lys Cys
 50 55 60

Gln Glu Cys Arg Leu Lys Lys Cys Leu Ala Val Gly Met Arg Pro Glu
 65 70 75 80

Cys Val Val Pro Glu Thr Gln Cys Ala Met Lys Arg Lys Glu Lys Lys
 85 90 95

Ala Gln Lys Glu Lys Asp Lys Leu Pro Val Ser Thr Thr Thr Val Asp
 100 105 110

Asp His Met Pro Pro Ile Met Gln Cys Glu Pro Pro Pro Pro Glu Ala
 115 120 125

Ala Arg Ile His Glu Val Val Pro Arg Phe Leu Ser Asp Lys Leu Leu
 130 135 140

Glu Thr Asn Arg Gln Lys Asn Ile Pro Gln Leu Thr Ala Asn Gln Gln
 145 150 155 160

Phe Leu Ile Ala Arg Leu Ile Trp Tyr Gln Asp Gly Tyr Glu Gln Pro
 165 170 175

Ser Asp Glu Asp Leu Lys Arg Ile Thr Gln Thr Trp Gln Gln Ala Asp
 180 185 190

Asp Glu Asn Glu Glu Ser Asp Thr Pro Phe Arg Gln Ile Thr Glu Met
 195 200 205

Thr Ile Leu Thr Val Gln Leu Ile Val Glu Phe Ala Lys Gly Leu Pro
 210 215 220

Gly Phe Ala Lys Ile Ser Gln Pro Asp Gln Ile Thr Leu Leu Lys Ala
 Page 11

| | | | | | | |
|-----------------------------|---|---------------------|-----|-----|-----|-----|
| 225 | | 230 | | 235 | | 240 |
| Cys Ser Ser Glu Val | Met Met Leu Arg Val | Ala Arg Arg Tyr Asp | Ala | | | |
| | 245 | | 250 | | 255 | |
| Ala Ser Asp Ser Val | Leu Phe Ala Asn Asn Gln Ala Tyr Thr | Arg Asp | | | | |
| | 260 | | 265 | | 270 | |
| Asn Tyr Arg Lys Ala Gly Met | Ala Tyr Val Ile Glu Asp | Leu Leu His | | | | |
| | 275 | | 280 | | 285 | |
| Phe Cys Arg Cys Met Tyr | Ser Met Ala Leu Asp Asn | Ile His Tyr Ala | | | | |
| | 290 | | 295 | | 300 | |
| Leu Leu Thr Ala Val | Val Ile Phe Ser Asp Arg Pro Gly Leu Glu Gln | | | | | |
| | 305 | | 310 | | 315 | 320 |
| Pro Gln Leu Val | Glu Glu Ile Gln Arg Tyr Tyr Leu Asn Thr | Leu Arg | | | | |
| | 325 | | 330 | | 335 | |
| Ile Tyr Ile | Leu Asn Gln Leu Ser Gly Ser Ala Arg Ser Ser | Val Ile | | | | |
| | 340 | | 345 | | 350 | |
| Tyr Gly Lys Ile Leu Ser Ile | Leu Ser Glu Leu Arg Thr Leu Gly Met | | | | | |
| | 355 | | 360 | | 365 | |
| Gln Asn Ser Asn Met Cys | Ile Ser Leu Lys Leu Lys Asn Arg Lys Leu | | | | | |
| | 370 | | 375 | | 380 | |
| Pro Pro Phe Leu Glu | Glu Ile Trp Asp Val Ala Asp Met Ser His Thr | | | | | |
| | 385 | | 390 | | 395 | 400 |
| Gln Pro Pro Pro | Ile Leu Glu Ser Pro Thr Asn Leu | | | | | |
| | 405 | | 410 | | | |

<210> 13
 <211> 334
 <212> PRT
 <213> Choristoneura fumiferana
 <400> 13

| | |
|---|---|
| Pro Glu Cys Val | Val Pro Glu Thr Gln Cys Ala Met Lys Arg Lys Glu |
| 1 | 5 10 15 |
| Lys Lys Ala Gln Lys Glu Lys Asp Lys Leu Pro Val Ser Thr Thr Thr | |
| | 20 25 30 |
| Val Asp Asp His Met Pro Pro Ile Met Gln Cys Glu Pro Pro Pro Pro | |
| | 35 40 45 |

Glu Ala Ala Arg Ile His Glu Val Val Pro Arg Phe Leu Ser Asp Lys
50 55 60

Leu Leu Glu Thr Asn Arg Gln Lys Asn Ile Pro Gln Leu Thr Ala Asn
65 70 75 80

Gln Gln Phe Leu Ile Ala Arg Leu Ile Trp Tyr Gln Asp Gly Tyr Glu
85 90 95

Gln Pro Ser Asp Glu Asp Leu Lys Arg Ile Thr Gln Thr Trp Gln Gln
100 105 110

Ala Asp Asp Glu Asn Glu Glu Ser Asp Thr Pro Phe Arg Gln Ile Thr
115 120 125

Glu Met Thr Ile Leu Thr Val Gln Leu Ile Val Glu Phe Ala Lys Gly
130 135 140

Leu Pro Gly Phe Ala Lys Ile Ser Gln Pro Asp Gln Ile Thr Leu Leu
145 150 155 160

Lys Ala Cys Ser Ser Glu Val Met Met Leu Arg Val Ala Arg Arg Tyr
165 170 175

Asp Ala Ala Ser Asp Ser Val Leu Phe Ala Asn Asn Gln Ala Tyr Thr
180 185 190

Arg Asp Asn Tyr Arg Lys Ala Gly Met Ala Tyr Val Ile Glu Asp Leu
195 200 205

Leu His Phe Cys Arg Cys Met Tyr Ser Met Ala Leu Asp Asn Ile His
210 215 220

Tyr Ala Leu Leu Thr Ala Val Val Ile Phe Ser Asp Arg Pro Gly Leu
225 230 235 240

Glu Gln Pro Gln Leu Val Glu Glu Ile Gln Arg Tyr Tyr Leu Asn Thr
245 250 255

Leu Arg Ile Tyr Ile Leu Asn Gln Leu Ser Gly Ser Ala Arg Ser Ser
260 265 270

Val Ile Tyr Gly Lys Ile Leu Ser Ile Leu Ser Glu Leu Arg Thr Leu
275 280 285

Gly Met Gln Asn Ser Asn Met Cys Ile Ser Leu Lys Leu Lys Asn Arg
290 295 300

Lys Leu Pro Pro Phe Leu Glu Glu Ile Trp Asp Val Ala Asp Met Ser
305 310 315 320

His Thr Gln Pro Pro Ile Leu Glu Ser Pro Thr Asn Leu
325 330

<210> 14

<211> 244

<212> PRT

<213> Choristoneura fumiferana

<400> 14

Tyr Gln Asp Gly Tyr Glu Gln Pro Ser Asp Glu Asp Leu Lys Arg Ile
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Thr Gln Thr Trp Gln Gln Ala Asp Asp Glu Asn Glu Glu Ser Asp Thr
20 25 30

Pro Phe Arg Gln Ile Thr Glu Met Thr Ile Leu Thr Val Gln Leu Ile
35 40 45

Val Glu Phe Ala Lys Gly Leu Pro Gly Phe Ala Lys Ile Ser Gln Pro
50 55 60

Asp Gln Ile Thr Leu Leu Lys Ala Cys Ser Ser Glu Val Met Met Leu
65 70 75 80

Arg Val Ala Arg Arg Tyr Asp Ala Ala Ser Asp Ser Val Leu Phe Ala
85 90 95

Asn Asn Gln Ala Tyr Thr Arg Asp Asn Tyr Arg Lys Ala Gly Met Ala
100 105 110

Tyr Val Ile Glu Asp Leu Leu His Phe Cys Arg Cys Met Tyr Ser Met
115 120 125

Ala Leu Asp Asn Ile His Tyr Ala Leu Leu Thr Ala Val Val Ile Phe
130 135 140

Ser Asp Arg Pro Gly Leu Glu Gln Pro Gln Leu Val Glu Glu Ile Gln
145 150 155 160

Arg Tyr Tyr Leu Asn Thr Leu Arg Ile Tyr Ile Leu Asn Gln Leu Ser
165 170 175

Gly Ser Ala Arg Ser Ser Val Ile Tyr Gly Lys Ile Leu Ser Ile Leu
180 185 190

Ser Glu Leu Arg Thr Leu Gly Met Gln Asn Ser Asn Met Cys Ile Ser
195 200 205

Leu Lys Leu Lys Asn Arg Lys Leu Pro Pro Phe Leu Glu Glu Ile Trp
210 215 220

Asp Val Ala Asp Met Ser His Thr Gln Pro Pro Pro Ile Leu Glu Ser
225 230 235 240

Pro Thr Asn Leu

<210> 15
<211> 320
<212> PRT
<213> Choristoneura fumiferana

<400> 15

Pro Glu Cys Val Val Pro Glu Thr Gln Cys Ala Met Lys Arg Lys Glu
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Lys Lys Ala Gln Lys Glu Lys Asp Lys Leu Pro Val Ser Thr Thr Thr
20 25 30

Val Asp Asp His Met Pro Pro Ile Met Gln Cys Glu Pro Pro Pro Pro
35 40 45

Glu Ala Ala Arg Ile His Glu Val Val Pro Arg Phe Leu Ser Asp Lys
50 55 60

Leu Leu Glu Thr Asn Arg Gln Lys Asn Ile Pro Gln Leu Thr Ala Asn
65 70 75 80

Gln Gln Phe Leu Ile Ala Arg Leu Ile Trp Tyr Gln Asp Gly Tyr Glu
85 90 95

Gln Pro Ser Asp Glu Asp Leu Lys Arg Ile Thr Gln Thr Trp Gln Gln
100 105 110

Ala Asp Asp Glu Asn Glu Glu Ser Asp Thr Pro Phe Arg Gln Ile Thr
115 120 125

Glu Met Thr Ile Leu Thr Val Gln Leu Ile Val Glu Phe Ala Lys Gly
130 135 140

Leu Pro Gly Phe Ala Lys Ile Ser Gln Pro Asp Gln Ile Thr Leu Leu
145 150 155 160

Lys Ala Cys Ser Ser Glu Val Met Met Leu Arg Val Ala Arg Arg Tyr
165 170 175

Asp Ala Ala Ser Asp Ser Val Leu Phe Ala Asn Asn Gln Ala Tyr Thr
180 185 190

Arg Asp Asn Tyr Arg Lys Ala Gly Met Ala Tyr Val Ile Glu Asp Leu
195 200 205

Leu His Phe Cys Arg Cys Met Tyr Ser Met Ala Leu Asp Asn Ile His
210 215 220

Tyr Ala Leu Leu Thr Ala Val Val Ile Phe Ser Asp Arg Pro Gly Leu
225 230 235 240

Glu Gln Pro Gln Leu Val Glu Glu Ile Gln Arg Tyr Tyr Leu Asn Thr
245 250 255

Leu Arg Ile Tyr Ile Leu Asn Gln Leu Ser Gly Ser Ala Arg Ser Ser
260 265 270

Val Ile Tyr Gly Lys Ile Leu Ser Ile Leu Ser Glu Leu Arg Thr Leu
275 280 285

Gly Met Gln Asn Ser Asn Met Cys Ile Ser Leu Lys Leu Lys Asn Arg
290 295 300

Lys Leu Pro Pro Phe Leu Glu Glu Ile Trp Asp Val Ala Asp Met Ser
305 310 315 320

<210> 16
<211> 625
<212> PRT
<213> Drosophila melanogaster

<400> 16

Gly Pro Ala Pro Arg Val Gln Glu Glu Leu Cys Leu Val Cys Gly Asp
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Arg Ala Ser Gly Tyr His Tyr Asn Ala Leu Thr Cys Glu Gly Cys Lys
20 25 30

Gly Phe Phe Arg Arg Ser Val Thr Lys Ser Ala Val Tyr Cys Cys Lys
35 40 45

Phe Gly Arg Ala Cys Glu Met Asp Met Tyr Met Arg Arg Lys Cys Gln
50 55 60

Glu Cys Arg Leu Lys Lys Cys Leu Ala Val Gly Met Arg Pro Glu Cys
Page 16

| | | | | | | | | | | | | | | | |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Val | Val | Pro | Glu | Asn 85 | Gln | Cys | Ala | Met | Lys 90 | Arg | Arg | Glu | Lys | Lys 95 | Ala |
| Gln | Lys | Glu | Lys 100 | Asp | Lys | Met | Thr | Thr 105 | Ser | Pro | Ser | Ser | Gln 110 | His | Gly |
| Gly | Asn | Gly 115 | Ser | Leu | Ala | Ser | Gly 120 | Gly | Gly | Gln | Asp | Phe 125 | Val | Lys | Lys |
| Glu | Ile 130 | Leu | Asp | Leu | Met | Thr 135 | Cys | Glu | Pro | Pro | Gln 140 | His | Ala | Thr | Ile |
| Pro 145 | Leu | Leu | Pro | Asp | Glu 150 | Ile | Leu | Ala | Lys | Cys 155 | Gln | Ala | Arg | Asn | Ile 160 |
| Pro | Ser | Leu | Thr | Tyr 165 | Asn | Gln | Leu | Ala | Val 170 | Ile | Tyr | Lys | Leu | Ile 175 | Trp |
| Tyr | Gln | Asp | Gly 180 | Tyr | Glu | Gln | Pro | Ser 185 | Glu | Glu | Asp | Leu | Arg 190 | Arg | Ile |
| Met | Ser | Gln 195 | Pro | Asp | Glu | Asn | Glu 200 | Ser | Gln | Thr | Asp | Val 205 | Ser | Phe | Arg |
| His | Ile 210 | Thr | Glu | Ile | Thr | Ile 215 | Leu | Thr | Val | Gln | Leu 220 | Ile | Val | Glu | Phe |
| Ala 225 | Lys | Gly | Leu | Pro | Ala 230 | Phe | Thr | Lys | Ile | Pro 235 | Gln | Glu | Asp | Gln | Ile 240 |
| Thr | Leu | Leu | Lys | Ala 245 | Cys | Ser | Ser | Glu | Val 250 | Met | Met | Leu | Arg | Met 255 | Ala |
| Arg | Arg | Tyr | Asp 260 | His | Ser | Ser | Asp | Ser 265 | Ile | Phe | Phe | Ala | Asn 270 | Asn | Arg |
| Ser | Tyr | Thr 275 | Arg | Asp | Ser | Tyr | Lys 280 | Met | Ala | Gly | Met | Ala 285 | Asp | Asn | Ile |
| Glu | Asp 290 | Leu | Leu | His | Phe | Cys 295 | Arg | Gln | Met | Phe | Ser 300 | Met | Lys | Val | Asp |
| Asn 305 | Val | Glu | Tyr | Ala | Leu 310 | Leu | Thr | Ala | Ile | Val 315 | Ile | Phe | Ser | Asp | Arg 320 |
| Pro | Gly | Leu | Glu | Lys | Ala | Gln | Leu | Val | Glu | Ala | Ile | Gln | Ser | Tyr | Tyr |

325 330 335
 Ile Asp Thr Leu Arg Ile Tyr Ile Leu Asn Arg His Cys Gly Asp Ser
 340 345 350
 Met Ser Leu Val Phe Tyr Ala Lys Leu Leu Ser Ile Leu Thr Glu Leu
 355 360 365
 Arg Thr Leu Gly Asn Gln Asn Ala Glu Met Cys Phe Ser Leu Lys Leu
 370 375 380
 Lys Asn Arg Lys Leu Pro Lys Phe Leu Glu Glu Ile Trp Asp Val His
 385 390 395 400
 Ala Ile Pro Pro Ser Val Gln Ser His Leu Gln Ile Thr Gln Glu Glu
 405 410 415
 Asn Glu Arg Leu Glu Arg Ala Glu Arg Met Arg Ala Ser Val Gly Gly
 420 425 430
 Ala Ile Thr Ala Gly Ile Asp Cys Asp Ser Ala Ser Thr Ser Ala Ala
 435 440 445
 Ala Ala Ala Ala Gln His Gln Pro Gln Pro Gln Pro Gln Pro Gln Pro
 450 455 460
 Ser Ser Leu Thr Gln Asn Asp Ser Gln His Gln Thr Gln Pro Gln Leu
 465 470 475 480
 Gln Pro Gln Leu Pro Pro Gln Leu Gln Gly Gln Leu Gln Pro Gln Leu
 485 490 495
 Gln Pro Gln Leu Gln Thr Gln Leu Gln Pro Gln Ile Gln Pro Gln Pro
 500 505 510
 Gln Leu Leu Pro Val Ser Ala Pro Val Pro Ala Ser Val Thr Ala Pro
 515 520 525
 Gly Ser Leu Ser Ala Val Ser Thr Ser Ser Glu Tyr Met Gly Gly Ser
 530 535 540
 Ala Ala Ile Gly Pro Ile Thr Pro Ala Thr Thr Ser Ser Ile Thr Ala
 545 550 555 560
 Ala Val Thr Ala Ser Ser Thr Thr Ser Ala Val Pro Met Gly Asn Gly
 565 570 575
 Val Gly Val Gly Val Gly Val Gly Gly Asn Val Ser Met Tyr Ala Asn

580

585

590

Ala Gln Thr Ala Met Ala Leu Met Gly Val Ala Leu His Ser His Gln
595 600 605

Glu Gln Leu Ile Gly Gly Val Ala Val Lys Ser Glu His Ser Thr Thr
610 615 620

Ala
625

<210> 17
<211> 583
<212> PRT
<213> *Drosophila melanogaster*

<400> 17

Ala Val Tyr Cys Cys Lys Phe Gly Arg Ala Cys Glu Met Asp Met Tyr
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Met Arg Arg Lys Cys Gln Glu Cys Arg Leu Lys Lys Cys Leu Ala Val
20 25 30

Gly Met Arg Pro Glu Cys Val Val Pro Glu Asn Gln Cys Ala Met Lys
35 40 45

Arg Arg Glu Lys Lys Ala Gln Lys Glu Lys Asp Lys Met Thr Thr Ser
50 55 60

Pro Ser Ser Gln His Gly Gly Asn Gly Ser Leu Ala Ser Gly Gly Gly
65 70 75 80

Gln Asp Phe Val Lys Lys Glu Ile Leu Asp Leu Met Thr Cys Glu Pro
85 90 95

Pro Gln His Ala Thr Ile Pro Leu Leu Pro Asp Glu Ile Leu Ala Lys
100 105 110

Cys Gln Ala Arg Asn Ile Pro Ser Leu Thr Tyr Asn Gln Leu Ala Val
115 120 125

Ile Tyr Lys Leu Ile Trp Tyr Gln Asp Gly Tyr Glu Gln Pro Ser Glu
130 135 140

Glu Asp Leu Arg Arg Ile Met Ser Gln Pro Asp Glu Asn Glu Ser Gln
145 150 155 160

Thr Asp Val Ser Phe Arg His Ile Thr Glu Ile Thr Ile Leu Thr Val
165 170 175

Gln Leu Ile Val Glu Phe Ala Lys Gly Leu Pro Ala Phe Thr Lys Ile
180 185 190

Pro Gln Glu Asp Gln Ile Thr Leu Leu Lys Ala Cys Ser Ser Glu Val
195 200 205

Met Met Leu Arg Met Ala Arg Arg Tyr Asp His Ser Ser Asp Ser Ile
210 215 220

Phe Phe Ala Asn Asn Arg Ser Tyr Thr Arg Asp Ser Tyr Lys Met Ala
225 230 235 240

Gly Met Ala Asp Asn Ile Glu Asp Leu Leu His Phe Cys Arg Gln Met
245 250 255

Phe Ser Met Lys Val Asp Asn Val Glu Tyr Ala Leu Leu Thr Ala Ile
260 265 270

Val Ile Phe Ser Asp Arg Pro Gly Leu Glu Lys Ala Gln Leu Val Glu
275 280 285

Ala Ile Gln Ser Tyr Tyr Ile Asp Thr Leu Arg Ile Tyr Ile Leu Asn
290 295 300

Arg His Cys Gly Asp Ser Met Ser Leu Val Phe Tyr Ala Lys Leu Leu
305 310 315 320

Ser Ile Leu Thr Glu Leu Arg Thr Leu Gly Asn Gln Asn Ala Glu Met
325 330 335

Cys Phe Ser Leu Lys Leu Lys Asn Arg Lys Leu Pro Lys Phe Leu Glu
340 345 350

Glu Ile Trp Asp Val His Ala Ile Pro Pro Ser Val Gln Ser His Leu
355 360 365

Gln Ile Thr Gln Glu Glu Asn Glu Arg Leu Glu Arg Ala Glu Arg Met
370 375 380

Arg Ala Ser Val Gly Gly Ala Ile Thr Ala Gly Ile Asp Cys Asp Ser
385 390 395 400

Ala Ser Thr Ser Ala Ala Ala Ala Ala Ala Gln His Gln Pro Gln Pro
405 410 415

Gln Pro Gln Pro Gln Pro Ser Ser Leu Thr Gln Asn Asp Ser Gln His
420 425 430

Gln Thr Gln Pro Gln Leu Gln Pro Gln Leu Pro Pro Gln Leu Gln Gly
435 440 445

Gln Leu Gln Pro Gln Leu Gln Pro Gln Leu Gln Thr Gln Leu Gln Pro
450 455 460

Gln Ile Gln Pro Gln Pro Gln Leu Leu Pro Val Ser Ala Pro Val Pro
465 470 475 480

Ala Ser Val Thr Ala Pro Gly Ser Leu Ser Ala Val Ser Thr Ser Ser
485 490 495

Glu Tyr Met Gly Gly Ser Ala Ala Ile Gly Pro Ile Thr Pro Ala Thr
500 505 510

Thr Ser Ser Ile Thr Ala Ala Val Thr Ala Ser Ser Thr Thr Ser Ala
515 520 525

Val Pro Met Gly Asn Gly Val Gly Val Gly Val Gly Val Gly Gly Asn
530 535 540

Val Ser Met Tyr Ala Asn Ala Gln Thr Ala Met Ala Leu Met Gly Val
545 550 555 560

Ala Leu His Ser His Gln Glu Gln Leu Ile Gly Gly Val Ala Val Lys
565 570 575

Ser Glu His Ser Thr Thr Ala
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<210> 18
<211> 549
<212> PRT
<213> *Drosophila melanogaster*

<400> 18

Arg Pro Glu Cys Val Val Pro Glu Asn Gln Cys Ala Met Lys Arg Arg
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Glu Lys Lys Ala Gln Lys Glu Lys Asp Lys Met Thr Thr Ser Pro Ser
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Ser Gln His Gly Gly Asn Gly Ser Leu Ala Ser Gly Gly Gly Gln Asp
35 40 45

Phe Val Lys Lys Glu Ile Leu Asp Leu Met Thr Cys Glu Pro Pro Gln
50 55 60

His Ala Thr Ile Pro Leu Leu Pro Asp Glu Ile Leu Ala Lys Cys Gln
 65 70 75 80
 Ala Arg Asn Ile Pro Ser Leu Thr Tyr Asn Gln Leu Ala Val Ile Tyr
 85 90 95
 Lys Leu Ile Trp Tyr Gln Asp Gly Tyr Glu Gln Pro Ser Glu Glu Asp
 100 105 110
 Leu Arg Arg Ile Met Ser Gln Pro Asp Glu Asn Glu Ser Gln Thr Asp
 115 120 125
 Val Ser Phe Arg His Ile Thr Glu Ile Thr Ile Leu Thr Val Gln Leu
 130 135 140
 Ile Val Glu Phe Ala Lys Gly Leu Pro Ala Phe Thr Lys Ile Pro Gln
 145 150 155 160
 Glu Asp Gln Ile Thr Leu Leu Lys Ala Cys Ser Ser Glu Val Met Met
 165 170 175
 Leu Arg Met Ala Arg Arg Tyr Asp His Ser Ser Asp Ser Ile Phe Phe
 180 185 190
 Ala Asn Asn Arg Ser Tyr Thr Arg Asp Ser Tyr Lys Met Ala Gly Met
 195 200 205
 Ala Asp Asn Ile Glu Asp Leu Leu His Phe Cys Arg Gln Met Phe Ser
 210 215 220
 Met Lys Val Asp Asn Val Glu Tyr Ala Leu Leu Thr Ala Ile Val Ile
 225 230 235 240
 Phe Ser Asp Arg Pro Gly Leu Glu Lys Ala Gln Leu Val Glu Ala Ile
 245 250 255
 Gln Ser Tyr Tyr Ile Asp Thr Leu Arg Ile Tyr Ile Leu Asn Arg His
 260 265 270
 Cys Gly Asp Ser Met Ser Leu Val Phe Tyr Ala Lys Leu Leu Ser Ile
 275 280 285
 Leu Thr Glu Leu Arg Thr Leu Gly Asn Gln Asn Ala Glu Met Cys Phe
 290 295 300
 Ser Leu Lys Leu Lys Asn Arg Lys Leu Pro Lys Phe Leu Glu Glu Ile
 305 310 315 320

Trp Asp Val His Ala Ile Pro Pro Ser Val Gln Ser His Leu Gln Ile
325 330 335

Thr Gln Glu Glu Asn Glu Arg Leu Glu Arg Ala Glu Arg Met Arg Ala
340 345 350

Ser Val Gly Gly Ala Ile Thr Ala Gly Ile Asp Cys Asp Ser Ala Ser
355 360 365

Thr Ser Ala Ala Ala Ala Ala Ala Gln His Gln Pro Gln Pro Gln Pro
370 375 380

Gln Pro Gln Pro Ser Ser Leu Thr Gln Asn Asp Ser Gln His Gln Thr
385 390 395 400

Gln Pro Gln Leu Gln Pro Gln Leu Pro Pro Gln Leu Gln Gly Gln Leu
405 410 415

Gln Pro Gln Leu Gln Pro Gln Leu Gln Thr Gln Leu Gln Pro Gln Ile
420 425 430

Gln Pro Gln Pro Gln Leu Leu Pro Val Ser Ala Pro Val Pro Ala Ser
435 440 445

Val Thr Ala Pro Gly Ser Leu Ser Ala Val Ser Thr Ser Ser Glu Tyr
450 455 460

Met Gly Gly Ser Ala Ala Ile Gly Pro Ile Thr Pro Ala Thr Thr Ser
465 470 475 480

Ser Ile Thr Ala Ala Val Thr Ala Ser Ser Thr Thr Ser Ala Val Pro
485 490 495

Met Gly Asn Gly Val Gly Val Gly Val Gly Val Gly Gly Asn Val Ser
500 505 510

Met Tyr Ala Asn Ala Gln Thr Ala Met Ala Leu Met Gly Val Ala Leu
515 520 525

His Ser His Gln Glu Gln Leu Ile Gly Gly Val Ala Val Lys Ser Glu
530 535 540

His Ser Thr Thr Ala
545

<210> 19
<211> 445
<212> PRT

<213> Drosophila melanogaster

<400> 19

Tyr Glu Gln Pro Ser Glu Glu Asp Leu Arg Arg Ile Met Ser Gln Pro
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Asp Glu Asn Glu Ser Gln Thr Asp Val Ser Phe Arg His Ile Thr Glu
20 25 30

Ile Thr Ile Leu Thr Val Gln Leu Ile Val Glu Phe Ala Lys Gly Leu
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Pro Ala Phe Thr Lys Ile Pro Gln Glu Asp Gln Ile Thr Leu Leu Lys
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Gln Thr Gln Leu Gln Pro Gln Ile Gln Pro Gln Pro Gln Leu Leu Pro
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Val Gly Val Gly Gly Asn Val Ser Met Tyr Ala Asn Ala Gln Thr Ala
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Page 25

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25

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Cys Gly Asp Ser Met Ser Leu Val Phe Tyr Ala Lys Leu Leu Ser Ile
 Page 26

275

280

285

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Gln Val Ile Leu Leu Arg Ala Gly Trp Asn Glu Leu Leu Ile Ala Ser
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Gly Leu His Val His Arg Asn Ser Ala His Ser Ala Gly Val Gly Ala
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Gln Met Asp Lys Thr Glu Leu Gly Cys Leu Arg Ala Ile Val Leu Phe
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Arg Glu Lys Val Tyr Ala Ser Leu Glu Ala Tyr Cys Lys His Lys Tyr
195 200 205

Pro Glu Gln Pro Gly Arg Phe Ala Lys Leu Leu Leu Arg Leu Pro Ala
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210

215

220

Leu Arg Ser Ile Gly Leu Lys Cys Leu Glu His Leu Phe Phe Phe Lys
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 130 135 140

Leu Arg Ala Ile Val Leu Phe Asn Pro Asp Ser Lys Gly Leu Ser Asn
 145 150 155 160

Pro Ala Glu Val Glu Ala Leu Arg Glu Lys Val Tyr Ala Ser Leu Glu
 165 170 175

Ala Tyr Cys Lys His Lys Tyr Pro Glu Gln Pro Gly Arg Phe Ala Lys
180 185 190

Leu Leu Leu Arg Leu Pro Ala Leu Arg Ser Ile Gly Leu Lys Cys Leu
195 200 205

Glu His Leu Phe Phe Phe Lys Leu Ile Gly Asp Thr Pro Ile Asp Thr
210 215 220

Phe Leu Met Glu Met Leu Glu Ala Pro His Gln Ala Thr
225 230 235

<210> 34
<211> 177
<212> PRT
<213> Mus musculus

<400> 34

Ile Pro His Phe Ser Glu Leu Pro Leu Asp Asp Gln Val Ile Leu Leu
1 5 10 15

Arg Ala Gly Trp Asn Glu Leu Leu Ile Ala Ser Phe Ser His Arg Ser
20 25 30

Ile Ala Val Lys Asp Gly Ile Leu Leu Ala Thr Gly Leu His Val His
35 40 45

Arg Asn Ser Ala His Ser Ala Gly Val Gly Ala Ile Phe Asp Arg Val
50 55 60

Leu Thr Glu Leu Val Ser Lys Met Arg Asp Met Gln Met Asp Lys Thr
65 70 75 80

Glu Leu Gly Cys Leu Arg Ala Ile Val Leu Phe Asn Pro Asp Ser Lys
85 90 95

Gly Leu Ser Asn Pro Ala Glu Val Glu Ala Leu Arg Glu Lys Val Tyr
100 105 110

Ala Ser Leu Glu Ala Tyr Cys Lys His Lys Tyr Pro Glu Gln Pro Gly
115 120 125

Arg Phe Ala Lys Leu Leu Leu Arg Leu Pro Ala Leu Arg Ser Ile Gly
130 135 140

Leu Lys Cys Leu Glu His Leu Phe Phe Phe Lys Leu Ile Gly Asp Thr
145 150 155 160

Pro Ile Asp Thr Phe Leu Met Glu Met Leu Glu Ala Pro His Gln Ala
165 170 175

Thr

<210> 35
<211> 224
<212> PRT
<213> Mus musculus

<400> 35

Ala Asn Glu Asp Met Pro Val Glu Lys Ile Leu Glu Ala Glu Leu Ala
1 5 10 15

Val Glu Pro Lys Thr Glu Thr Tyr Val Glu Ala Asn Met Gly Leu Asn
20 25 30

Pro Ser Ser Pro Asn Asp Pro Val Thr Asn Ile Cys Gln Ala Ala Asp
35 40 45

Lys Gln Leu Phe Thr Leu Val Glu Trp Ala Lys Arg Ile Pro His Phe
50 55 60

Ser Glu Leu Pro Leu Asp Asp Gln Val Ile Leu Leu Arg Ala Gly Trp
65 70 75 80

Asn Glu Leu Leu Ile Ala Ser Phe Ser His Arg Ser Ile Ala Val Lys
85 90 95

Asp Gly Ile Leu Leu Ala Thr Gly Leu His Val His Arg Asn Ser Ala
100 105 110

His Ser Ala Gly Val Gly Ala Ile Phe Asp Arg Val Leu Thr Glu Leu
115 120 125

Val Ser Lys Met Arg Asp Met Gln Met Asp Lys Thr Glu Leu Gly Cys
130 135 140

Leu Arg Ala Ile Val Leu Phe Asn Pro Asp Ser Lys Gly Leu Ser Asn
145 150 155 160

Pro Ala Glu Val Glu Ala Leu Arg Glu Lys Val Tyr Ala Ser Leu Glu
165 170 175

Ala Tyr Cys Lys His Lys Tyr Pro Glu Gln Pro Gly Arg Phe Ala Lys
180 185 190

Leu Leu Leu Arg Leu Pro Ala Leu Arg Ser Ile Gly Leu Lys Cys Leu
195 200 205

Glu His Leu Phe Phe Phe Lys Leu Ile Gly Asp Thr Pro Ile Asp Thr
210 215 220

<210> 36
<211> 328
<212> PRT
<213> Homo sapiens

<400> 36

Cys Ala Ile Cys Gly Asp Arg Ser Ser Gly Lys His Tyr Gly Val Tyr
1 5 10 15

Ser Cys Glu Gly Cys Lys Gly Phe Phe Lys Arg Thr Val Arg Lys Asp
20 25 30

Leu Thr Tyr Thr Cys Arg Asp Asn Lys Asp Cys Leu Ile Asp Lys Arg
35 40 45

Gln Arg Asn Arg Cys Gln Tyr Cys Arg Tyr Gln Lys Cys Leu Ala Met
50 55 60

Gly Met Lys Arg Glu Ala Val Gln Glu Glu Arg Gln Arg Gly Lys Asp
65 70 75 80

Arg Asn Glu Asn Glu Val Glu Ser Thr Ser Ser Ala Asn Glu Asp Met
85 90 95

Pro Val Glu Arg Ile Leu Glu Ala Glu Leu Ala Val Glu Pro Lys Thr
100 105 110

Glu Thr Tyr Val Glu Ala Asn Met Gly Leu Asn Pro Ser Ser Pro Asn
115 120 125

Asp Pro Val Thr Asn Ile Cys Gln Ala Ala Asp Lys Gln Leu Phe Thr
130 135 140

Leu Val Glu Trp Ala Lys Arg Ile Pro His Phe Ser Glu Leu Pro Leu
145 150 155 160

Asp Asp Gln Val Ile Leu Leu Arg Ala Gly Trp Asn Glu Leu Leu Ile
165 170 175

Ala Ser Phe Ser His Arg Ser Ile Ala Val Lys Asp Gly Ile Leu Leu
180 185 190

Ala Thr Gly Leu His Val His Arg Asn Ser Ala His Ser Ala Gly Val
Page 38

195

200

205

Gly Ala Ile Phe Asp Arg Val Leu Thr Glu Leu Val Ser Lys Met Arg
 210 215 220

Asp Met Gln Met Asp Lys Thr Glu Leu Gly Cys Leu Arg Ala Ile Val
 225 230 235 240

Leu Phe Asn Pro Asp Ser Lys Gly Leu Ser Asn Pro Ala Glu Val Glu
 245 250 255

Ala Leu Arg Glu Lys Val Tyr Ala Ser Leu Glu Ala Tyr Cys Lys His
 260 265 270

Lys Tyr Pro Glu Gln Pro Gly Arg Phe Ala Lys Leu Leu Leu Arg Leu
 275 280 285

Pro Ala Leu Arg Ser Ile Gly Leu Lys Cys Leu Glu His Leu Phe Phe
 290 295 300

Phe Lys Leu Ile Gly Asp Thr Pro Ile Asp Thr Phe Leu Met Glu Met
 305 310 315 320

Leu Glu Ala Pro His Gln Met Thr
 325

<210> 37
 <211> 262
 <212> PRT
 <213> Homo sapiens

<400> 37

Lys Arg Glu Ala Val Gln Glu Glu Arg Gln Arg Gly Lys Asp Arg Asn
 1 5 10 15

Glu Asn Glu Val Glu Ser Thr Ser Ser Ala Asn Glu Asp Met Pro Val
 20 25 30

Glu Arg Ile Leu Glu Ala Glu Leu Ala Val Glu Pro Lys Thr Glu Thr
 35 40 45

Tyr Val Glu Ala Asn Met Gly Leu Asn Pro Ser Ser Pro Asn Asp Pro
 50 55 60

Val Thr Asn Ile Cys Gln Ala Ala Asp Lys Gln Leu Phe Thr Leu Val
 65 70 75 80

Glu Trp Ala Lys Arg Ile Pro His Phe Ser Glu Leu Pro Leu Asp Asp
 85 90 95

Gln Val Ile Leu Leu Arg Ala Gly Trp Asn Glu Leu Leu Ile Ala Ser
100 105 110

Phe Ser His Arg Ser Ile Ala Val Lys Asp Gly Ile Leu Leu Ala Thr
115 120 125

Gly Leu His Val His Arg Asn Ser Ala His Ser Ala Gly Val Gly Ala
130 135 140

Ile Phe Asp Arg Val Leu Thr Glu Leu Val Ser Lys Met Arg Asp Met
145 150 155 160

Gln Met Asp Lys Thr Glu Leu Gly Cys Leu Arg Ala Ile Val Leu Phe
165 170 175

Asn Pro Asp Ser Lys Gly Leu Ser Asn Pro Ala Glu Val Glu Ala Leu
180 185 190

Arg Glu Lys Val Tyr Ala Ser Leu Glu Ala Tyr Cys Lys His Lys Tyr
195 200 205

Pro Glu Gln Pro Gly Arg Phe Ala Lys Leu Leu Leu Arg Leu Pro Ala
210 215 220

Leu Arg Ser Ile Gly Leu Lys Cys Leu Glu His Leu Phe Phe Phe Lys
225 230 235 240

Leu Ile Gly Asp Thr Pro Ile Asp Thr Phe Leu Met Glu Met Leu Glu
245 250 255

Ala Pro His Gln Met Thr
260

<210> 38
<211> 237
<212> PRT
<213> Homo sapiens

<400> 38

Ala Asn Glu Asp Met Pro Val Glu Arg Ile Leu Glu Ala Glu Leu Ala
1 5 10 15

Val Glu Pro Lys Thr Glu Thr Tyr Val Glu Ala Asn Met Gly Leu Asn
20 25 30

Pro Ser Ser Pro Asn Asp Pro Val Thr Asn Ile Cys Gln Ala Ala Asp
35 40 45

Lys Gln Leu Phe Thr Leu Val Glu Trp Ala Lys Arg Ile Pro His Phe
50 55 60

Ser Glu Leu Pro Leu Asp Asp Gln Val Ile Leu Leu Arg Ala Gly Trp
65 70 75 80

Asn Glu Leu Leu Ile Ala Ser Phe Ser His Arg Ser Ile Ala Val Lys
85 90 95

Asp Gly Ile Leu Leu Ala Thr Gly Leu His Val His Arg Asn Ser Ala
100 105 110

His Ser Ala Gly Val Gly Ala Ile Phe Asp Arg Val Leu Thr Glu Leu
115 120 125

Val Ser Lys Met Arg Asp Met Gln Met Asp Lys Thr Glu Leu Gly Cys
130 135 140

Leu Arg Ala Ile Val Leu Phe Asn Pro Asp Ser Lys Gly Leu Ser Asn
145 150 155 160

Pro Ala Glu Val Glu Ala Leu Arg Glu Lys Val Tyr Ala Ser Leu Glu
165 170 175

Ala Tyr Cys Lys His Lys Tyr Pro Glu Gln Pro Gly Arg Phe Ala Lys
180 185 190

Leu Leu Leu Arg Leu Pro Ala Leu Arg Ser Ile Gly Leu Lys Cys Leu
195 200 205

Glu His Leu Phe Phe Phe Lys Leu Ile Gly Asp Thr Pro Ile Asp Thr
210 215 220

Phe Leu Met Glu Met Leu Glu Ala Pro His Gln Met Thr
225 230 235

<210> 39
<211> 177
<212> PRT
<213> Homo sapiens

<400> 39

Ile Pro His Phe Ser Glu Leu Pro Leu Asp Asp Gln Val Ile Leu Leu
1 5 10 15

Arg Ala Gly Trp Asn Glu Leu Leu Ile Ala Ser Phe Ser His Arg Ser
20 25 30

Ile Ala Val Lys Asp Gly Ile Leu Leu Ala Thr Gly Leu His Val His
35 40 45

Arg Asn Ser Ala His Ser Ala Gly Val Gly Ala Ile Phe Asp Arg Val
50 55 60

Leu Thr Glu Leu Val Ser Lys Met Arg Asp Met Gln Met Asp Lys Thr
65 70 75 80

Glu Leu Gly Cys Leu Arg Ala Ile Val Leu Phe Asn Pro Asp Ser Lys
85 90 95

Gly Leu Ser Asn Pro Ala Glu Val Glu Ala Leu Arg Glu Lys Val Tyr
100 105 110

Ala Ser Leu Glu Ala Tyr Cys Lys His Lys Tyr Pro Glu Gln Pro Gly
115 120 125

Arg Phe Ala Lys Leu Leu Leu Arg Leu Pro Ala Leu Arg Ser Ile Gly
130 135 140

Leu Lys Cys Leu Glu His Leu Phe Phe Phe Lys Leu Ile Gly Asp Thr
145 150 155 160

Pro Ile Asp Thr Phe Leu Met Glu Met Leu Glu Ala Pro His Gln Met
165 170 175

Thr

<210> 40
<211> 224
<212> PRT
<213> Homo sapiens

<400> 40

Ala Asn Glu Asp Met Pro Val Glu Arg Ile Leu Glu Ala Glu Leu Ala
1 5 10 15

Val Glu Pro Lys Thr Glu Thr Tyr Val Glu Ala Asn Met Gly Leu Asn
20 25 30

Pro Ser Ser Pro Asn Asp Pro Val Thr Asn Ile Cys Gln Ala Ala Asp
35 40 45

Lys Gln Leu Phe Thr Leu Val Glu Trp Ala Lys Arg Ile Pro His Phe
50 55 60

Ser Glu Leu Pro Leu Asp Asp Gln Val Ile Leu Leu Arg Ala Gly Trp
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| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 65 | | 70 | | 75 | | 80 | | | | | | | | | |
| Asn | Glu | Leu | Leu | Ile | Ala | Ser | Phe | Ser | His | Arg | Ser | Ile | Ala | Val | Lys |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Asp | Gly | Ile | Leu | Leu | Ala | Thr | Gly | Leu | His | Val | His | Arg | Asn | Ser | Ala |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| His | Ser | Ala | Gly | Val | Gly | Ala | Ile | Phe | Asp | Arg | Val | Leu | Thr | Glu | Leu |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Val | Ser | Lys | Met | Arg | Asp | Met | Gln | Met | Asp | Lys | Thr | Glu | Leu | Gly | Cys |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Leu | Arg | Ala | Ile | Val | Leu | Phe | Asn | Pro | Asp | Ser | Lys | Gly | Leu | Ser | Asn |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Pro | Ala | Glu | Val | Glu | Ala | Leu | Arg | Glu | Lys | Val | Tyr | Ala | Ser | Leu | Glu |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Ala | Tyr | Cys | Lys | His | Lys | Tyr | Pro | Glu | Gln | Pro | Gly | Arg | Phe | Ala | Lys |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Leu | Leu | Leu | Arg | Leu | Pro | Ala | Leu | Arg | Ser | Ile | Gly | Leu | Lys | Cys | Leu |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Glu | His | Leu | Phe | Phe | Phe | Lys | Leu | Ile | Gly | Asp | Thr | Pro | Ile | Asp | Thr |
| | 210 | | | | | 215 | | | | | 220 | | | | |

<210> 41
 <211> 198
 <212> DNA
 <213> Choristoneura fumiferana

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| tgtaaagggt tcttcagacg gagtgttacc aaaaatgcgg tttatatttg taaattcggt | 120 |
| cacgcttgcg aaatggacat gtacatgcga cggaaatgcc aggagtgccg cctgaagaag | 180 |
| tgcttagctg taggcatg | 198 |

<210> 42
 <211> 66
 <212> PRT
 <213> Choristoneura fumiferana

| |
|---|
| <400> 42 |
| Cys Leu Val Cys Gly Asp Arg Ala Ser Gly Tyr His Tyr Asn Ala Leu |
| 1 5 10 15 |

Thr Cys Glu Gly Cys Lys Gly Phe Phe Arg Arg Ser Val Thr Lys Asn
 20 25 30

Ala Val Tyr Ile Cys Lys Phe Gly His Ala Cys Glu Met Asp Met Tyr
 35 40 45

Met Arg Arg Lys Cys Gln Gly Cys Arg Leu Lys Lys Cys Leu Ala Val
 50 55 60

Gly Met
 65

<210> 43
 <211> 441
 <212> DNA
 <213> *Saccharomyces cerevisiae*

<400> 43
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 tctcccaaaa ccaaagggtc tccgctgact agggcacatc tgacagaagt ggaatcaagg 180
 ctagaaagac tggaacagct atttctactg atttttcctc gagaagacct tgacatgatt 240
 ttgaaaatgg attctttaca ggatataaaa gcattgttaa caggattatt tgtacaagat 300
 aatgtgaata aagatgccgt cacagataga ttggcttcag tggagactga tatgcctcta 360
 acattgagac agcatagaat aagtgcgaca tcatcatcgg aagagagtag taacaaaggt 420
 caaagacagt tgactgtatc g 441

<210> 44
 <211> 147
 <212> PRT
 <213> *Saccharomyces cerevisiae*

<400> 44

Met Lys Leu Leu Ser Ser Ile Glu Gln Ala Cys Asp Ile Cys Arg Leu
 1 5 10 15

Lys Lys Leu Lys Cys Ser Lys Glu Lys Pro Lys Cys Ala Lys Cys Leu
 20 25 30

Lys Asn Asn Trp Glu Cys Arg Tyr Ser Pro Lys Thr Lys Arg Ser Pro
 35 40 45

Leu Thr Arg Ala His Leu Thr Glu Val Glu Ser Arg Leu Glu Arg Leu
 50 55 60

Glu Gln Leu Phe Leu Leu Ile Phe Pro Arg Glu Asp Leu Asp Met Ile
 Page 44

65

70

75

80

Leu

Lys

Met

Asp

Ser

Leu

Gln

Asp

Ile

Lys

Ala

Leu

Leu

Thr

Gly

Leu

85

90

95

Phe

Val

Gln

Asp

Asn

Val

Asn

Lys

Asp

Ala

Val

Thr

Asp

Arg

Leu

Ala

100

105

110

Ser

Val

Glu

Thr

Asp

Met

Pro

Leu

Thr

Leu

Arg

Gln

His

Arg

Ile

Ser

115

120

125

Ala

Thr

Ser

Ser

Ser

Glu

Glu

Ser

Ser

Asn

Lys

Gly

Gln

Arg

Gln

Leu

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135

140

Thr

Val

Ser

145

<210>

45

<211>

606

<212>

DNA

<213>

Escherichia coli

<400>

45

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60

cagacaggta tgccgccgac gcgtgcggaa atcgcgcagc gtttgggggtt ccgttcccca

120

aacgcggctg aagaacatct gaaggcgctg gcacgcaaag gcgttattga aattgtttcc

180

ggcgcacac gcgggattcg tctgttgagc gaagaggaag aagggttgcc gctggtaggt

240

cgtgtggctg ccggtgaacc acttctggcg caacagcata ttgaagggtca ttatcagggtc

300

gataccttcct tattcaagcc gaatgctgat ttctgtctgc gcgtcagcgg gatgtcgatg

360

aaagatatcg gcattatgga tgggtgacttg ctggcagtgc ataaaactca ggatgtacgt

420

aacggtcagg tcgttgctgc acgtattgat gacgaagtta ccgttaagcg cctgaaaaaa

480

cagggcaata aagtcgaact gttgccagaa aatagcgagt ttaaaccaat tgtcgtagat

540

cttcgtcagc agagcttcac cattgaaggg ctggcggttg gggttattcg caacggcgac

600

tggtctg

606

<210>

46

<211>

202

<212>

PRT

<213>

Escherichia coli

<400>

46

Met

Lys

Ala

Leu

Thr

Ala

Arg

Gln

Gln

Glu

Val

Phe

Asp

Leu

Ile

Arg

1

5

10

15

Asp

His

Ile

Ser

Gln

Thr

Gly

Met

Pro

Pro

Thr

Arg

Ala

Glu

Ile

Ala

Page

45

20 25 30
 Gln Arg Leu Gly Phe Arg Ser Pro Asn Ala Ala Glu Glu His Leu Lys
 35 40 45
 Ala Leu Ala Arg Lys Gly Val Ile Glu Ile Val Ser Gly Ala Ser Arg
 50 55 60
 Gly Ile Arg Leu Leu Gln Glu Glu Glu Glu Gly Leu Pro Leu Val Gly
 65 70 75 80
 Arg Val Ala Ala Gly Glu Pro Leu Leu Ala Gln Gln His Ile Glu Gly
 85 90 95
 His Tyr Gln Val Asp Pro Ser Leu Phe Lys Pro Asn Ala Asp Phe Leu
 100 105 110
 Leu Arg Val Ser Gly Met Ser Met Lys Asp Ile Gly Ile Met Asp Gly
 115 120 125
 Asp Leu Leu Ala Val His Lys Thr Gln Asp Val Arg Asn Gly Gln Val
 130 135 140
 Val Val Ala Arg Ile Asp Asp Glu Val Thr Val Lys Arg Leu Lys Lys
 145 150 155 160
 Gln Gly Asn Lys Val Glu Leu Leu Pro Glu Asn Ser Glu Phe Lys Pro
 165 170 175
 Ile Val Val Asp Leu Arg Gln Gln Ser Phe Thr Ile Glu Gly Leu Ala
 180 185 190
 Val Gly Val Ile Arg Asn Gly Asp Trp Leu
 195 200

<210> 47
 <211> 420
 <212> DNA
 <213> Choristoneura fumiferana

<400> 47
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 gagtcgctcg cctcgccaga gtacggcggg ctcgagctct ggggatacga cgatggggtg 180
 tcatacaaca cggcgcagtc cttgctgggc aatacttgca cgatgcagca gcagcaacag 240
 acgcagccgc tgccgtcgat gccgttgctt atgccgccga ccacgccgaa gtctgaaaac 300
 gagtctatatt cctcaggccg tgaggaactg tcgccagctt caagtataaa tgggtgcagt 360

acagatggcg aggcacgacg tcagaagaag ggccctgcgc cccgtcagca agaggaactg 420

<210> 48
 <211> 140
 <212> PRT
 <213> Choristoneura fumiferana

<400> 48

Met Arg Arg Arg Trp Ser Asn Asn Gly Gly Phe Gln Thr Leu Arg Met
 1 5 10 15

Leu Glu Glu Ser Ser Ser Glu Val Thr Ser Ser Ser Ala Leu Gly Leu
 20 25 30

Pro Ala Ala Met Val Met Ser Pro Glu Ser Leu Ala Ser Pro Glu Tyr
 35 40 45

Gly Gly Leu Glu Leu Trp Gly Tyr Asp Asp Gly Leu Ser Tyr Asn Thr
 50 55 60

Ala Gln Ser Leu Leu Gly Asn Thr Cys Thr Met Gln Gln Gln Gln Gln
 65 70 75 80

Thr Gln Pro Leu Pro Ser Met Pro Leu Pro Met Pro Pro Thr Thr Pro
 85 90 95

Lys Ser Glu Asn Glu Ser Ile Ser Ser Gly Arg Glu Glu Leu Ser Pro
 100 105 110

Ala Ser Ser Ile Asn Gly Cys Ser Thr Asp Gly Glu Ala Arg Arg Gln
 115 120 125

Lys Lys Gly Pro Ala Pro Arg Gln Gln Glu Glu Leu
 130 135 140

<210> 49
 <211> 271
 <212> DNA
 <213> herpes simplex virus 7

<400> 49

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 ctccacttag acggcgagga cgtggcgatg gcgcatgccg acgcgctaga cgatttcgat 120
 ctggacatgt tgggggacgg ggattccccg gggccgggat ttacccccca cgactccgcc 180
 ccctacggcg ctctggatat ggccgacttc gagtttgagc agatgtttac cgatgccctt 240
 ggaattgacg agtacggtgg ggaattccccg g 271

<210> 50
 <211> 90
 <212> PRT
 <213> herpes simplex virus 7

<400> 50.

Met Gly Pro Lys Lys Lys Arg Lys Val Ala Pro Pro Thr Asp Val Ser
 1 5 10 15

Leu Gly Asp Glu Leu His Leu Asp Gly Glu Asp Val Ala Met Ala His
 20 25 30

Ala Asp Ala Leu Asp Asp Phe Asp Leu Asp Met Leu Gly Asp Gly Asp
 35 40 45

Ser Pro Gly Pro Gly Phe Thr Pro His Asp Ser Ala Pro Tyr Gly Ala
 50 55 60

Leu Asp Met Ala Asp Phe Glu Phe Glu Gln Met Phe Thr Asp Ala Leu
 65 70 75 80

Gly Ile Asp Glu Tyr Gly Gly Glu Phe Pro
 85 90

<210> 51
 <211> 307
 <212> DNA
 <213> Saccharomyces cerevisiae

<400> 51
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 gaaatggcgg atcaggcgat taacgtggtg ccgggcatga cgccgaaaac cattcttcac 180
 gccgggccgc cgatccagcc tgactggctg aaatcgaatg gttttcatga aattgaagcg 240
 gatgttaacg ataccagcct cttgctgagt ggagatgcct cctaccctta tgatgtgcc a 300
 gattatg 307

<210> 52
 <211> 102
 <212> PRT
 <213> Saccharomyces cerevisiae

<400> 52

Met Gly Ala Pro Pro Lys Lys Lys Arg Lys Val Ala Gly Ile Asn Lys
 1 5 10 15

Asp Ile Glu Glu Cys Asn Ala Ile Ile Glu Gln Phe Ile Asp Tyr Leu
 20 25 30

Arg Thr Gly Gln Glu Met Pro Met Glu Met Ala Asp Gln Ala Ile Asn
 35 40 45

Val Val Pro Gly Met Thr Pro Lys Thr Ile Leu His Ala Gly Pro Pro
 50 55 60

Ile Gln Pro Asp Trp Leu Lys Ser Asn Gly Phe His Glu Ile Glu Ala
 65 70 75 80

Asp Val Asn Asp Thr Ser Leu Leu Leu Ser Gly Asp Ala Ser Tyr Pro
 85 90 95

Tyr Asp Val Pro Asp Tyr
 100

<210> 53
 <211> 807
 <212> DNA
 <213> Homo sapiens

<400> 53
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 aaaaggacat atgagacctt caagagcatc atgaagaaga gtcctttcag cggacccacc 120
 gacccccggc ctccacctcg acgcattgct gtgccttccc gcagctcagc ttctgtcccc 180
 aagccagcac cccagcccta tccctttacg tcatccctga gcaccatcaa ctatgatgag 240
 tttcccacca tgggtgtttcc ttctgggcag atcagccagg cctcggcctt ggccccggcc 300
 cctccccaag tcttgcccca ggctccagcc cctgccccctg ctccagccat ggtatcagct 360
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 ccacctgccc ccaagccac ccaggctggg gaaggaacgc tgtcagaggc cctgctgcag 480
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 cctgtggccc cccacacaac tgagcccatg ctgatggagt accctgaggc tataactcgc 660
 ctagtgcagc gggcccagag gcccccgac ccagctcctg ctccactggg ggccccgggg 720
 ctccccaatg gcctcctttc aggagatgaa gacttctcct ccattgcgga catggacttc 780
 tcagccctgc tgagtcagat cagctcc 807

<210> 54
 <211> 269
 <212> PRT
 <213> Homo sapiens

<400> 54

Pro Met Glu Phe Gln Tyr Leu Pro Asp Thr Asp Asp Arg His Arg Ile
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| | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|--|
| 1 | | 5 | | 10 | | 15 | | | | | | | | | | | | | |
| Glu | Glu | Lys | Arg | Lys | Arg | Thr | Tyr | Glu | Thr | Phe | Lys | Ser | Ile | Met | Lys | | | | |
| | | | 20 | | | | | 25 | | | | | 30 | | | | | | |
| Lys | Ser | Pro | Phe | Ser | Gly | Pro | Thr | Asp | Pro | Arg | Pro | Pro | Pro | Arg | Arg | | | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | | | |
| Ile | Ala | Val | Pro | Ser | Arg | Ser | Ser | Ala | Ser | Val | Pro | Lys | Pro | Ala | Pro | | | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | | | |
| Gln | Pro | Tyr | Pro | Phe | Thr | Ser | Ser | Leu | Ser | Thr | Ile | Asn | Tyr | Asp | Glu | | | | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | | | | |
| Phe | Pro | Thr | Met | Val | Phe | Pro | Ser | Gly | Gln | Ile | Ser | Gln | Ala | Ser | Ala | | | | |
| | | | | 85 | | | | | 90 | | | | | 95 | | | | | |
| Leu | Ala | Pro | Ala | Pro | Pro | Gln | Val | Leu | Pro | Gln | Ala | Pro | Ala | Pro | Ala | | | | |
| | | | 100 | | | | | 105 | | | | | | 110 | | | | | |
| Pro | Ala | Pro | Ala | Met | Val | Ser | Ala | Leu | Ala | Gln | Ala | Pro | Ala | Pro | Val | | | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | | | |
| Pro | Val | Leu | Ala | Pro | Gly | Pro | Pro | Gln | Ala | Val | Ala | Pro | Pro | Ala | Pro | | | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | | | |
| Lys | Pro | Thr | Gln | Ala | Gly | Glu | Gly | Thr | Leu | Ser | Glu | Ala | Leu | Leu | Gln | | | | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | | | | |
| Leu | Gln | Phe | Asp | Asp | Glu | Asp | Leu | Gly | Ala | Leu | Leu | Gly | Asn | Ser | Thr | | | | |
| | | | | 165 | | | | | 170 | | | | | 175 | | | | | |
| Asp | Pro | Ala | Val | Phe | Thr | Asp | Leu | Ala | Ser | Val | Asp | Asn | Ser | Glu | Phe | | | | |
| | | | 180 | | | | | 185 | | | | | 190 | | | | | | |
| Gln | Gln | Leu | Leu | Asn | Gln | Gly | Ile | Pro | Val | Ala | Pro | His | Thr | Thr | Glu | | | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | | | |
| Pro | Met | Leu | Met | Glu | Tyr | Pro | Glu | Ala | Ile | Thr | Arg | Leu | Val | Thr | Gly | | | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | | | |
| Ala | Gln | Arg | Pro | Pro | Asp | Pro | Ala | Pro | Ala | Pro | Leu | Gly | Ala | Pro | Gly | | | | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | | | | |
| Leu | Pro | Asn | Gly | Leu | Leu | Ser | Gly | Asp | Glu | Asp | Phe | Ser | Ser | Ile | Ala | | | | |
| | | | | 245 | | | | | 250 | | | | | 255 | | | | | |

<210> 55
 <211> 225
 <212> DNA
 <213> *Drosophila melanogaster*

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 ttgtccaatg tcgagagaca aggggggttca atgcacttgt ccaatgtcga gagacaaggg 120
 ggttcaatgc acttgtccaa tgtcgagaga caaggggggtt caatgcactt gtccaatgtc 180
 gagagacaag ggggttcaat gcacttgtcc aatgtcgact ctaga 225

<210> 56
 <211> 19
 <212> DNA
 <213> *Saccharomyces cerevisiae*

<400> 56
 ggagtactgt cctccgagc 19

<210> 57
 <211> 666
 <212> DNA
 <213> *Escherichia coli*

<400> 57
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 ttagctctac cacagtgtgt gaaccaatgt atccagcacc acctgtaacc aaaacaattt 120
 tagaagtact ttcactttgt aactgagctg tcattttatat tgaattttca aaaattctta 180
 cttttttttt ggatggacgc aaagaagttt aataatcata ttacatggca ttaccaccat 240
 atacatatcc atatacatat ccatatctaa tcttacctcg actgctgtat ataaaaccag 300
 tggttatatg tacagtactg ctgtatataa aaccagtggg tatatgtaca gtacgtcgac 360
 tgctgtatat aaaaccagtg gttatatgta cagtactgct gtatataaaa ccagtgggta 420
 tatgtacagt acgtcgaggg atgataatgc gattagtttt ttagccttat ttctggggta 480
 attaatacgc gaagcgatga tttttgatct attaacagat atataaatgc aaaaactgca 540
 taaccacttt aactaatact ttcaacattt tcggtttgta ttactttcta ttcaaagtga 600
 ataaaagtat caacaaaaaa ttgttaatat acctctatac tttaacgtca aggagaaaaa 660
 actata 666

<210> 58
 <211> 1542
 <212> DNA
 <213> *Choristoneura fumiferana*

<400> 58

| | |
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| ccgggggtcc acaacggcca ggtcaacggc cacgtgaggg actggatggc aggcggcgct | 120 |
| ggtgcccaatt cgccgtctcc gggagcgggtg gctcaacccc agcctaacaa tgggtattcg | 180 |
| tcgccactct cctcgggaag ctacgggccc tacagtccaa atgggaaaat aggccgtgag | 240 |
| gaactgtcgc cagcttcaag tataaatggg tgcagtacag atggcgaggc acgacgtcag | 300 |
| aagaagggcc ctgcgccccg tcagcaagag gaactgtgtc tggatatcggt ggacagagcc | 360 |
| tccggatacc actacaatgc gctcacgtgt gaaggggtgta aagggttctt cagacggagt | 420 |
| gttaccaaaa atgcggttta tttttgtaaa ttcggtcacg cttgcgaaat ggacatgtac | 480 |
| atgcgacgga aatgccagga gtgccgcctg aagaagtgtc tagctgtagg catgaggcct | 540 |
| gagtgcgtag taccgcagac tcagtgcgcc atgaagcgga aagagaagaa agcacagaag | 600 |
| gagaaggaca aactgcctgt cagcacgacg acggtggacg accacatgcc gccattatg | 660 |
| cagtgtgaac ctccacctcc tgaagcagca aggattcacg aagtgggtccc aaggtttctc | 720 |
| tccgacaagc tgttggagac aaaccggcag aaaaacatcc cccagttgac agccaaccag | 780 |
| cagttcctta tcgccaggct catctggtac caggacgggt acgagcagcc ttctgatgaa | 840 |
| gatttgaaga ggattacgca gacgtggcag caagcggacg atgaaaacga agagtctgac | 900 |
| actcccttcc gccagatcac agagatgact atcctcacgg tccaacttat cgtggagttc | 960 |
| gcgaagggat tgccagggtt cgccaagatc tcgcagcctg atcaaattac gctgcttaag | 1020 |
| gcttgctcaa gtgaggtaat gatgtctcga gtcgcgcgac gatacgatgc ggcctcagac | 1080 |
| agtgttctgt tcgcgaacaa ccaagcgtag actcgcgaca actaccgcaa ggctggcatg | 1140 |
| gcctacgtca tcgaggatct actgcacttc tgccgggtgca tgtactctat ggcgttgac | 1200 |
| aacatccatt acgcgctgct cacggctgtc gtcattcttt ctgaccggcc agggttggag | 1260 |
| cagccgcaac tgggtggaaga aatccagcgg tactacctga atacgctccg catctatatc | 1320 |
| ctgaaccagc tgagcgggtc ggcgcgttcg tccgtcatat acggcaagat cctctcaatc | 1380 |
| ctctctgagc tacgcacgct cggcatgcaa aactccaaca tgtgcatctc cctcaagctc | 1440 |
| aagaacagaa agctgccgcc tttcctcgag gagatctggg atgtggcgga catgtcgcac | 1500 |
| acccaaccgc cgcctatcct cgagtcccc acgaatctct ag | 1542 |

<210> 59
 <211> 513
 <212> PRT
 <213> Choristoneura fumiferana

<400> 59

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Asp | Leu | Lys | His | Glu | Val | Ala | Tyr | Arg | Gly | Val | Leu | Pro | Gly | Gln |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |

Val Lys Ala Glu Pro Gly Val His Asn Gly Gln Val Asn Gly His Val
 20 30
 Arg Asp Trp Met Ala Gly Gly Ala Gly Ala Asn Ser Pro Ser Pro Gly
 35 40 45
 Ala Val Ala Gln Pro Gln Pro Asn Asn Gly Tyr Ser Ser Pro Leu Ser
 50 55 60
 Ser Gly Ser Tyr Gly Pro Tyr Ser Pro Asn Gly Lys Ile Gly Arg Glu
 65 70 75 80
 Glu Leu Ser Pro Ala Ser Ser Ile Asn Gly Cys Ser Thr Asp Gly Glu
 85 90 95
 Ala Arg Arg Gln Lys Lys Gly Pro Ala Pro Arg Gln Gln Glu Glu Leu
 100 105 110
 Cys Leu Val Cys Gly Asp Arg Ala Ser Gly Tyr His Tyr Asn Ala Leu
 115 120 125
 Thr Cys Glu Gly Cys Lys Gly Phe Phe Arg Arg Ser Val Thr Lys Asn
 130 135 140
 Ala Val Tyr Ile Cys Lys Phe Gly His Ala Cys Glu Met Asp Met Tyr
 145 150 155 160
 Met Arg Arg Lys Cys Gln Glu Cys Arg Leu Lys Lys Cys Leu Ala Val
 165 170 175
 Gly Met Arg Pro Glu Cys Val Val Pro Glu Thr Gln Cys Ala Met Lys
 180 185 190
 Arg Lys Glu Lys Lys Ala Gln Lys Glu Lys Asp Lys Leu Pro Val Ser
 195 200 205
 Thr Thr Thr Val Asp Asp His Met Pro Pro Ile Met Gln Cys Glu Pro
 210 215 220
 Pro Pro Pro Glu Ala Ala Arg Ile His Glu Val Val Pro Arg Phe Leu
 225 230 235 240
 Ser Asp Lys Leu Leu Glu Thr Asn Arg Gln Lys Asn Ile Pro Gln Leu
 245 250 255
 Thr Ala Asn Gln Gln Phe Leu Ile Ala Arg Leu Ile Trp Tyr Gln Asp
 260 265 270

Gly Tyr Glu Gln Pro Ser Asp Glu Asp Leu Lys Arg Ile Thr Gln Thr
 275 280 285
 Trp Gln Gln Ala Asp Asp Glu Asn Glu Glu Ser Asp Thr Pro Phe Arg
 290 295 300
 Gln Ile Thr Glu Met Thr Ile Leu Thr Val Gln Leu Ile Val Glu Phe
 305 310 315 320
 Ala Lys Gly Leu Pro Gly Phe Ala Lys Ile Ser Gln Pro Asp Gln Ile
 325 330 335
 Thr Leu Leu Lys Ala Cys Ser Ser Glu Val Met Met Leu Arg Val Ala
 340 345 350
 Arg Arg Tyr Asp Ala Ala Ser Asp Ser Val Leu Phe Ala Asn Asn Gln
 355 360 365
 Ala Tyr Thr Arg Asp Asn Tyr Arg Lys Ala Gly Met Ala Tyr Val Ile
 370 375 380
 Glu Asp Leu Leu His Phe Cys Arg Cys Met Tyr Ser Met Ala Leu Asp
 385 390 395 400
 Asn Ile His Tyr Ala Leu Leu Thr Ala Val Val Ile Phe Ser Asp Arg
 405 410 415
 Pro Gly Leu Glu Gln Pro Gln Leu Val Glu Glu Ile Gln Arg Tyr Tyr
 420 425 430
 Leu Asn Thr Leu Arg Ile Tyr Ile Leu Asn Gln Leu Ser Gly Ser Ala
 435 440 445
 Arg Ser Ser Val Ile Tyr Gly Lys Ile Leu Ser Ile Leu Ser Glu Leu
 450 455 460
 Arg Thr Leu Gly Met Gln Asn Ser Asn Met Cys Ile Ser Leu Lys Leu
 465 470 475 480
 Lys Asn Arg Lys Leu Pro Pro Phe Leu Glu Glu Ile Trp Asp Val Ala
 485 490 495
 Asp Met Ser His Thr Gln Pro Pro Pro Ile Leu Glu Ser Pro Thr Asn
 500 505 510
 Leu

<210> 60
 <211> 4375
 <212> DNA
 <213> *Choristoneura fumiferana*

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 gaatattaga cgtcataatt cacgagtgtc ttttaaattt atatagcgat tagcggggcc 180
 gtttggttga cgtgcgcttg cgtttagtgg agtgcaggga tagtgaggcg agtatggtag 240
 ttcgtggtca tgtcaagtgt ggcgaagaaa gacaagccga cgatgtcggg gacggcgctg 300
 atcaactggg cgcggccggc gccgccaggc ccgccgcagc cgcagtcagc gtcgcctgcg 360
 ccggcagcca tgctgcagca gctcccagc cagtcaatgc agtcgttaaa ccacatccca 420
 actgtcgatt gctcgctcga tatgcagtgg ctttaatttag aacctggatt catgtcgcct 480
 atgtcacctc ctgagatgaa accagacacc gccatgcttg atgggctacg agacgacgcc 540
 acttcgccgc ctaacttcaa gaactacccg cctaatacacc ccctgagtgg ctccaaacac 600
 ctatgctcta tatgcggcga cagggcgctc ggggaagcact atggggtgta cagttgcgaa 660
 ggatgcaagg gtttcttcaa gcggaccgtc cggaaggacc tgtcgtacgc ttgccgggag 720
 gagcggaact gcatcataga caagcgacaa aggaaccgat gccagtactg ccgctatcaa 780
 aagtgttttg cttgcggtat gaagcgagag gcggtgcaag aggagcgcca gaggaatgct 840
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 gagcgcctaa cggagatgga gtctttggtg gcagatccca gcgaggagtt ccagttcctc 960
 cgcgtggggc ctgacagcaa cgtgcctcca cgttaccgcg cgcctgtctc ctccctctgc 1020
 caaataggca acaagcaaat agcggcggtg gtggtatggg cgcgcgacat ccctcatttc 1080
 gggcagctgg agctggacga tcaagtggta ctcatcaagg cctcctggaa tgagctgcta 1140
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 ggaacgcgga gcaccactca gccacaactg atgtgtctca tgcctggcat gacgttgcac 1260
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 agtctgaaga tgcgcacctt gcgcatggac caggccgagt acgtcgcgct caaagccatc 1380
 gtgctgctca accctgatgt gaaaggactg aagaatcggc aagaagtga cgttttgca 1440
 gaaaaaatgt tctcttgctt ggacgactac tgccggcggt cgcaagcaa cgaggaaggc 1500
 cggtttgctg ctttgctgct gcggctgcca gctctccgct ccatctcgct caagagcttc 1560
 gaacacctct acttcttcca cctcgtggcc gaaggctcca tcagcgata catacgagag 1620
 gcgctccgaa accacgcgcc tccgatcgac gtcaatgcc a tgatgtaaag tgcgatacac 1680
 gccctgccga tgtgagaaga actatggcta atagaagcga aactgaatac atctagggtg 1740

| | | | | | | |
|-------------|-------------|------------|------------|------------|-------------|------|
| ggacttaact | tgggactatc | attaaagtat | cacgcaaatt | atgcgtagtc | agaaagtcgc | 1800 |
| gtcgatcaaa | cttttttata | aacgaattga | gtttctaacg | actgcaacac | agcggagttt | 1860 |
| tgcttctgat | agttttttatt | ctaattggta | agatgcttta | cacgggcatt | attgacattc | 1920 |
| aagtgttaagt | ggaagttgac | aaccttgaca | tttatatcac | gtttgtaatt | ggttaaataa | 1980 |
| attaattaat | cacaagtaag | actaacatca | acgtcacgat | actaacgcca | tttagtgata | 2040 |
| tttttcatgt | caagaaactc | attgttttga | taaaatattt | ttctaattac | tccagtgaac | 2100 |
| tcattccaaat | gtgacccagt | ttcccgcaga | gttgcccgtg | taaaatcatc | tttagggaca | 2160 |
| tatccccgc | tatctcatga | aattccaagg | atcagtaggg | gccaattccc | ccgatgtggt | 2220 |
| gggaggcaga | attttcgata | atctacgact | attgttagcc | tacgaattag | ttgaattttt | 2280 |
| tgaaattatt | tttattaagt | cgccactttc | caaacacatc | agcaggggat | atgtgcaatt | 2340 |
| ttgtaacgat | aactctattc | atttctgata | tttatcgaaa | ttttatctta | cataacatgc | 2400 |
| tggctgggtcc | aggtgttttg | tagttacata | tgtatctacg | gtttgtttta | aattatagct | 2460 |
| tttttattgt | aatctgtata | aaattgagtt | atcttacttc | acactacgat | cgagtaaacc | 2520 |
| catcgtcagc | tacgaaaaac | taatcgata | aggcgtaaga | gtaaataact | aattgacaac | 2580 |
| cagcaacgag | gaccacctca | gtcctcgtgc | ttacattgtg | ccgtagctta | atatgatgga | 2640 |
| agctgtcgtc | gttacgacat | tagataaagt | gcatgaatac | caaaaatgta | ccatcccgtg | 2700 |
| ctgatctctc | atgctctcgc | tgcgtgggac | ccgtgtcgag | tgtcgtaagg | actgactaat | 2760 |
| atttttagact | aggcgtctat | gcttcagtaa | ttccttatac | atattataag | tcattccaaat | 2820 |
| aacgagtaag | gcggcatggt | gagatcagca | ttccgagagt | caaagagccc | ctaactgtac | 2880 |
| tgagaagtag | agacaataca | ctgattttct | gagatgaacg | caaccgagat | tgacactaaa | 2940 |
| aatctatttta | tggatttcaa | aatggcgatg | cttgattgtc | tgcggcggtg | atagactgaa | 3000 |
| atggggttgc | ttaacactgg | atattgtttt | tattagttaa | tagtcttaca | ttgcaagttg | 3060 |
| gtaattcggg | gctaatatcg | accggtttgt | taactatcta | acggttccca | gtgtcaggca | 3120 |
| cacatctttc | ccaagcagac | aacgcaagag | tgtacaaaat | gtacatgtta | caaaataagg | 3180 |
| aacattcgtc | ggataagtgt | aacagttgat | aggtaaagaa | aatggggccg | cctctttatt | 3240 |
| attacgtagc | cgtaaaatta | ttaacgtatt | tagtttagat | gttcagctaa | ttaggataat | 3300 |
| tctatttgtc | gagtacctag | atgtccatag | tgaattaata | taataattag | actgttacgc | 3360 |
| gtaggtaatt | ataaagttta | ccaaatctct | cttcaaagca | aaaactttgt | acacttccgt | 3420 |
| actgagacgt | cgtagcttat | tctgattcac | gaaatatttg | gatcacattg | ttacaaggcg | 3480 |
| accgtcacgt | agtatatgat | tatttacaaa | tgacacgtat | gtatcaatgc | tataagtgtt | 3540 |
| ttcgttacat | atgtcgggtc | tttaacgtgc | atttcgatgt | gcagattaaa | aatagcaaga | 3600 |
| aatcttgaaa | ttgtttttaga | aaatatttga | tttccttatt | gaaagttatt | tttaaattgta | 3660 |

aatatttcgt aatcataata attatgtatt gtgtagttat ttcaccttta cggttgggat 3720
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taagatgaag gtgattaaac tttatcctta tcacaataaa aaaaaaaaaa aaaaa 4375

<210> 61
<211> 472
<212> PRT
<213> Choristoneura fumiferana

<400> 61

Met Ser Ser Val Ala Lys Lys Asp Lys Pro Thr Met Ser Val Thr Ala
1 5 10 15

Leu Ile Asn Trp Ala Arg Pro Ala Pro Pro Gly Pro Pro Gln Pro Gln
20 25 30

Ser Ala Ser Pro Ala Pro Ala Ala Met Leu Gln Gln Leu Pro Thr Gln
35 40 45

Ser Met Gln Ser Leu Asn His Ile Pro Thr Val Asp Cys Ser Leu Asp
50 55 60

Met Gln Trp Leu Asn Leu Glu Pro Gly Phe Met Ser Pro Met Ser Pro
65 70 75 80

Pro Glu Met Lys Pro Asp Thr Ala Met Leu Asp Gly Leu Arg Asp Asp
85 90 95

Ala Thr Ser Pro Pro Asn Phe Lys Asn Tyr Pro Pro Asn His Pro Leu
100 105 110

Ser Gly Ser Lys His Leu Cys Ser Ile Cys Gly Asp Arg Ala Ser Gly
115 120 125

Lys His Tyr Gly Val Tyr Ser Cys Glu Gly Cys Lys Gly Phe Phe Lys
 130 135 140
 Arg Thr Val Arg Lys Asp Leu Ser Tyr Ala Cys Arg Glu Glu Arg Asn
 145 150 155 160
 Cys Ile Ile Asp Lys Arg Gln Arg Asn Arg Cys Gln Tyr Cys Arg Tyr
 165 170 175
 Gln Lys Cys Leu Ala Cys Gly Met Lys Arg Glu Ala Val Gln Glu Glu
 180 185 190
 Arg Gln Arg Asn Ala Arg Gly Ala Glu Asp Ala His Pro Ser Ser Ser
 195 200 205
 Val Gln Val Ser Asp Glu Leu Ser Ile Glu Arg Leu Thr Glu Met Glu
 210 215 220
 Ser Leu Val Ala Asp Pro Ser Glu Glu Phe Gln Phe Leu Arg Val Gly
 225 230 235 240
 Pro Asp Ser Asn Val Pro Pro Arg Tyr Arg Ala Pro Val Ser Ser Leu
 245 250 255
 Cys Gln Ile Gly Asn Lys Gln Ile Ala Ala Leu Val Val Trp Ala Arg
 260 265 270
 Asp Ile Pro His Phe Gly Gln Leu Glu Leu Asp Asp Gln Val Val Leu
 275 280 285
 Ile Lys Ala Ser Trp Asn Glu Leu Leu Leu Phe Ala Ile Ala Trp Arg
 290 295 300
 Ser Met Glu Tyr Leu Glu Asp Glu Arg Glu Asn Gly Asp Gly Thr Arg
 305 310 315 320
 Ser Thr Thr Gln Pro Gln Leu Met Cys Leu Met Pro Gly Met Thr Leu
 325 330 335
 His Arg Asn Ser Ala Gln Gln Ala Gly Val Gly Ala Ile Phe Asp Arg
 340 345 350
 Val Leu Ser Glu Leu Ser Leu Lys Met Arg Thr Leu Arg Met Asp Gln
 355 360 365
 Ala Glu Tyr Val Ala Leu Lys Ala Ile Val Leu Leu Asn Pro Asp Val
 370 375 380

Lys Gly Leu Lys Asn Arg Gln Glu Val Asp Val Leu Arg Glu Lys Met
 385 390 395 400

Phe Ser Cys Leu Asp Asp Tyr Cys Arg Arg Ser Arg Ser Asn Glu Glu
 405 410 415

Gly Arg Phe Ala Ser Leu Leu Leu Arg Leu Pro Ala Leu Arg Ser Ile
 420 425 430

Ser Leu Lys Ser Phe Glu His Leu Tyr Phe Phe His Leu Val Ala Glu
 435 440 445

Gly Ser Ile Ser Gly Tyr Ile Arg Glu Ala Leu Arg Asn His Ala Pro
 450 455 460

Pro Ile Asp Val Asn Ala Met Met
 465 470

<210> 62
 <211> 1404
 <212> DNA
 <213> Mus musculus

<400> 62
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 ggaatcggct ctccactggg ctgcctggg cagctgcact ctctatcag caccctgagc 180
 tcccccatca atggcatggg tccgcccttc tctgtcatca gctcccccat gggcccgcac 240
 tccatgtcgg taccaccac accacattg ggcttcggga ctggtagccc ccagctcaat 300
 tcacccatga accctgtgag cagcactgag gatatcaagc cgccactagg cctcaatggc 360
 gtcctcaagg ttcttgccca tccctcagga aatatggcct ccttcaccaa gcacatctgt 420
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 aagggttct tcaagaggac agtacgaaa gacctgacct acacctgccg agacaacaag 540
 gactgcctga tcgacaagag acagcggaac cgggtgtcagt actgccgcta ccagaagtgc 600
 ctggccatgg gcatgaagcg ggaagctgtg caggaggagc ggcagcggg caaggaccgg 660
 aatgagaacg aggtggagtc caccagcagt gccaacgagg acatgcctgt agagaagatt 720
 ctggaagccg agcttgctgt cgagcccaag actgagacat acgtggaggc aaacatgggg 780
 ctgaaccca gctcacaaa tgaccctgtt accaacatct gtcaagcagc agacaagcag 840
 ctcttcactc ttgtggagtg ggccaagagg atcccacact tttctgagct gcccttagac 900
 gaccaggtca tcctgctacg ggcaggctgg aacgagctgc tgatcgctc cttctccac 960
 cgctccatag ctgtgaaaga tgggattctc ctggccaccg gcctgcacgt acaccggaac 1020

agcgctcaca gtgctgggggt gggcgccatc tttgacaggg tgctaacaga gctggtgtct 1080
 aagatgcgtg acatgcagat ggacaagacg gagctgggct gcctgcgagc cattgtcctg 1140
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<210> 63
 <211> 467
 <212> PRT
 <213> Mus musculus

<400> 63

Met Asp Thr Lys His Phe Leu Pro Leu Asp Phe Ser Thr Gln Val Asn
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Ser Ser Ser Leu Asn Ser Pro Thr Gly Arg Gly Ser Met Ala Val Pro
20 25 30

Ser Leu His Pro Ser Leu Gly Pro Gly Ile Gly Ser Pro Leu Gly Ser
35 40 45

Pro Gly Gln Leu His Ser Pro Ile Ser Thr Leu Ser Ser Pro Ile Asn
50 55 60

Gly Met Gly Pro Pro Phe Ser Val Ile Ser Ser Pro Met Gly Pro His
65 70 75 80

Ser Met Ser Val Pro Thr Thr Pro Thr Leu Gly Phe Gly Thr Gly Ser
85 90 95

Pro Gln Leu Asn Ser Pro Met Asn Pro Val Ser Ser Thr Glu Asp Ile
100 105 110

Lys Pro Pro Leu Gly Leu Asn Gly Val Leu Lys Val Pro Ala His Pro
115 120 125

Ser Gly Asn Met Ala Ser Phe Thr Lys His Ile Cys Ala Ile Cys Gly
130 135 140

Asp Arg Ser Ser Gly Lys His Tyr Gly Val Tyr Ser Cys Glu Gly Cys
145 150 155 160

Lys Gly Phe Phe Lys Arg Thr Val Arg Lys Asp Leu Thr Tyr Thr Cys
165 170 175

Arg Asp Asn Lys Asp Cys Leu Ile Asp Lys Arg Gln Arg Asn Arg Cys
180 185 190

Gln Tyr Cys Arg Tyr Gln Lys Cys Leu Ala Met Gly Met Lys Arg Glu
195 200 205

Ala Val Gln Glu Glu Arg Gln Arg Gly Lys Asp Arg Asn Glu Asn Glu
210 215 220

Val Glu Ser Thr Ser Ser Ala Asn Glu Asp Met Pro Val Glu Lys Ile
225 230 235 240

Leu Glu Ala Glu Leu Ala Val Glu Pro Lys Thr Glu Thr Tyr Val Glu
245 250 255

Ala Asn Met Gly Leu Asn Pro Ser Ser Pro Asn Asp Pro Val Thr Asn
260 265 270

Ile Cys Gln Ala Ala Asp Lys Gln Leu Phe Thr Leu Val Glu Trp Ala
275 280 285

Lys Arg Ile Pro His Phe Ser Glu Leu Pro Leu Asp Asp Gln Val Ile
290 295 300

Leu Leu Arg Ala Gly Trp Asn Glu Leu Leu Ile Ala Ser Phe Ser His
305 310 315 320

Arg Ser Ile Ala Val Lys Asp Gly Ile Leu Leu Ala Thr Gly Leu His
325 330 335

Val His Arg Asn Ser Ala His Ser Ala Gly Val Gly Ala Ile Phe Asp
340 345 350

Arg Val Leu Thr Glu Leu Val Ser Lys Met Arg Asp Met Gln Met Asp
355 360 365

Lys Thr Glu Leu Gly Cys Leu Arg Ala Ile Val Leu Phe Asn Pro Asp
370 375 380

Ser Lys Gly Leu Ser Asn Pro Ala Glu Val Glu Ala Leu Arg Glu Lys
385 390 395 400

Val Tyr Ala Ser Leu Glu Ala Tyr Cys Lys His Lys Tyr Pro Glu Gln
405 410 415

Pro Gly Arg Phe Ala Lys Leu Leu Leu Arg Leu Pro Ala Leu Arg Ser
420 425 430

Ile Gly Leu Lys Cys Leu Glu His Leu Phe Phe Phe Lys Leu Ile Gly
435 440 445

Asp Thr Pro Ile Asp Thr Phe Leu Met Glu Met Leu Glu Ala Pro His
450 455 460

Gln Ala Thr
465

<210> 64
<211> 309
<212> DNA
<213> Simian virus 40

<400> 64
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agtcagcaac caggtgtgga aagtccccag gctccccagc aggcagaagt atgcaaagca 120
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ctccgcccag ttccgcccata tctccgcccc atggctgact aatttttttt atttatgcag 240
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gcctaggct 309

<210> 65
<211> 24
<212> DNA
<213> Artificial

<220>
<223> Synthetic E1B minimal promoter

<400> 65
tatataatgg atccccgggt accg 24

<210> 66
<211> 1653
<212> DNA
<213> Photinus pyralis

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| | |
|--|------|
| aaaaaattac caataatcca gaaaattatt atcatggatt ctaaaacgga ttaccagga | 480 |
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| tttgtaccag agtcctttga tcgtgacaaa acaattgcac tgataatgaa ttcctctgga | 600 |
| tctactgggt tacctaaggg tgtggccctt ccgcatagaa ctgcctgcgt cagattctcg | 660 |
| catgccagag atcctatttt tggcaatcaa atcattccgg atactgcgat ttttaagtgtt | 720 |
| gttcatttcc atcacggttt tggaatgttt actacactcg gatatttgat atgtggattt | 780 |
| cgagtcgtct taatgtatag atttgaagaa gagctgtttt tacgatccct tcaggattac | 840 |
| aaaattcaaa gtgcgttgct agtaccaacc ctattttcat tcttcgcaa aagcactctg | 900 |
| attgacaaat acgatttatc taatttacac gaaattgctt ctgggggcg acctctttcg | 960 |
| aaagaagtcg gggagcgggt tgcaaacgc ttccatcttc cagggatacg acaaggatat | 1020 |
| gggctcactg agactacatc agctattctg attacacccg agggggatga taaaccgggc | 1080 |
| gcggtcggta aagttgttcc attttttgaa gcgaagggtg tggatctgga taccgggaaa | 1140 |
| acgctgggcg ttaatcagag aggcgaatta tgtgtcagag gacctatgat tatgtccggt | 1200 |
| tatgtaaaca atccggaagc gaccaacgcc ttgattgaca aggatggatg gctacattct | 1260 |
| ggagacatag cttactggga cgaagacgaa cacttcttca tagttgaccg cttgaagtct | 1320 |
| ttaattaaat acaaaggata tcaggtggcc cccgctgaat tggaatcgat attgttaca | 1380 |
| cacccaaca tcttcgacgc gggcgtggca ggtcttccc acgatgacgc cggatgaactt | 1440 |
| cccgccgccc ttgttgtttt ggagcacgga aagacgatga cggaaaaaga gatcgtggat | 1500 |
| tacgtcgcca gtcaagtaac aaccgcgaaa aagttgcgcg gaggagtgtg gtttgtggac | 1560 |
| gaagtaccga aaggctcttac cggaaaactc gacgcaagaa aaatcagaga gatcctcata | 1620 |
| aaggccaaga agggcggaat gtccaaattg taa | 1653 |

<210> 67
 <211> 867
 <212> DNA
 <213> Choristoneura fumiferana

| | |
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| ccgagtagct cggtgcaggt aagcgatgag ctgtcaatcg agcgcctaac ggagatggag | 120 |
| tctttggtgg cagatcccag cgaggagttc cagttcctcc gcgtggggcc tgacagcaac | 180 |
| gtgcctccac gttaccgcgc gcccgtctcc tccctctgcc aaataggcaa caagcaaata | 240 |
| gcggcggttg tggatgggc gcgcgacatc cctcatttcg ggcagctgga gctggacgat | 300 |
| caagtggtag tcatcaaggc ctcctggaat gagctgctac tcttcgccat cgcctggcgc | 360 |
| tctatggagt atttggaaga tgagaggag aacggggacg gaacgcggag caccactcag | 420 |

| | |
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| ccacaactga tgtgtctcat gcctggcatg acgttgcacc gcaactcggc gcagcaggcg | 480 |
| ggcgtgggcg ccatcttcga ccgcgtgctg tccgagctca gtctgaagat gcgcaccttg | 540 |
| cgcattggacc aggccgagta cgtcgcgctc aaagccatcg tgctgctcaa ccctgatgtg | 600 |
| aaaggactga agaatcggca agaagttgac gttttgcgag aaaaaatggt ctcttgacctg | 660 |
| gacgactact gccggcggtc gcgaagcaac gaggaaggcc ggtttgcgtc cttgctgctg | 720 |
| cggctgccag ctctccgctc catctcgtc aagagcttcg aacacctcta cttcttcac | 780 |
| ctcgtggccg aaggctccat cagcggatac atacgagagg cgctccgaaa ccacgcgcct | 840 |
| ccgatcgacg tcaatgccat gatgtaa | 867 |

<210> 68
 <211> 619
 <212> DNA
 <213> Cytomegalovirus

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| gacgtcaata atgacgtatg ttcccatagt aacgccaata gggactttcc attgacgtca | 120 |
| atgggtggag tatttacggt aaactgccc cttggcagta catcaagtgt atcatatgcc | 180 |
| aagtacgccc cctattgacg tcaatgacgg taaatggccc gcctggcatt atgcccagta | 240 |
| catgacctta tgggactttc ctacttgga gtacatctac gtattagtca tcgctattac | 300 |
| catggtgatg cggttttggc agtacatcaa tgggcgtgga tagcggtttg actcacgggg | 360 |
| atttccaagt ctccacccca ttgacgtcaa tgggagtttg ttttggcacc aaaatcaacg | 420 |
| ggactttcca aaatgtcgta acaactccgc cccattgacg caaatgggcg gtaggcgtgt | 480 |
| acggtgggag gtctatataa gcagagctcg tttagtgaac cgtcagatcg cctggagacg | 540 |
| ccatccacgc tgttttgacc tccatagaag acaccgggac cgatccagcc tccgcggccg | 600 |
| ggaacggtgc attggaacg | 619 |

<210> 69
 <211> 262
 <212> DNA
 <213> Rous sarcoma virus

| | |
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| <400> 69 | |
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| gccttacaag gagagaaaaa gcaccgtgca tgccgatagg tggaagtaag gtggtacgat | 120 |
| cgtgccttat taggaaggca acagacgggt ctgacatgga ttggacgaac cactgaattc | 180 |
| cgcattgcag agatattgta ttttaagtgcc tagctcgata caataaacgc catttgacca | 240 |
| ttcaccacat tggagtgcac ct | 262 |

<210> 70

<211> 1247
 <212> DNA
 <213> Choristoneura fumiferana

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 ctggtatgcg gggacagagc ctccggatac cactacaatg cgctcacgtg tgaaggggtgt 180
 aaagggttct tcagacggag tgttaccaa aatgcggttt atatttgtaa attcgggtcac 240
 gcttgcgaaa tggacatgta catgcgacgg aaatgccagg agtgccgcct gaagaagtgc 300
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 aatacgctcc gcatctatat cctgaaccag ctgagcgggt cggcgcggtc gtccgtcata 1140
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<210> 71
 <211> 440
 <212> PRT
 <213> Choristoneura fumiferana

<400> 71
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 1 5 10 15
 Gly Cys Ser Thr Asp Gly Glu Ala Arg Arg Gln Lys Lys Gly Pro Ala
 20 25 30

Pro Arg Gln Gln Glu Glu Leu Cys Leu Val Cys Gly Asp Arg Ala Ser
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35

40

45

Gly Tyr His Tyr Asn Ala Leu Thr Cys Glu Gly Cys Lys Gly Phe Phe
 50 55 60

Arg Arg Ser Val Thr Lys Asn Ala Val Tyr Ile Cys Lys Phe Gly His
 65 70 75 80

Ala Cys Glu Met Asp Met Tyr Met Arg Arg Lys Cys Gln Glu Cys Arg
 85 90 95

Leu Lys Lys Cys Leu Ala Val Gly Met Arg Pro Glu Cys Val Val Pro
 100 105 110

Glu Thr Gln Cys Ala Met Lys Arg Lys Glu Lys Lys Ala Gln Lys Glu
 115 120 125

Lys Asp Lys Leu Pro Val Ser Thr Thr Thr Val Asp Asp His Met Pro
 130 135 140

Pro Ile Met Gln Cys Glu Pro Pro Pro Pro Glu Ala Ala Arg Ile His
 145 150 155 160

Glu Val Val Pro Arg Phe Leu Ser Asp Lys Leu Leu Glu Thr Asn Arg
 165 170 175

Gln Lys Asn Ile Pro Gln Leu Thr Ala Asn Gln Gln Phe Leu Ile Ala
 180 185 190

Arg Leu Ile Trp Tyr Gln Asp Gly Tyr Glu Gln Pro Ser Asp Glu Asp
 195 200 205

Leu Lys Arg Ile Thr Gln Thr Trp Gln Gln Ala Asp Asp Glu Asn Glu
 210 215 220

Glu Ser Asp Thr Pro Phe Arg Gln Ile Thr Glu Met Thr Ile Leu Thr
 225 230 235 240

Val Gln Leu Ile Val Glu Phe Ala Lys Gly Leu Pro Gly Phe Ala Lys
 245 250 255

Ile Ser Gln Pro Asp Gln Ile Thr Leu Leu Lys Ala Cys Ser Ser Glu
 260 265 270

Val Met Met Leu Arg Val Ala Arg Arg Tyr Asp Ala Ala Ser Asp Ser
 275 280 285

Val Leu Phe Ala Asn Asn Gln Ala Tyr Thr Arg Asp Asn Tyr Arg Lys
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290

295

300

Ala Gly Met Ala Tyr Val Ile Glu Asp Leu Leu His Phe Cys Arg Cys
305 310 315 320

Met Tyr Ser Met Ala Leu Asp Asn Ile His Tyr Ala Leu Leu Thr Ala
325 330 335

Val Val Ile Phe Ser Asp Arg Pro Gly Leu Glu Gln Pro Gln Leu Val
340 345 350

Glu Glu Ile Gln Arg Tyr Tyr Leu Asn Thr Leu Arg Ile Tyr Ile Leu
355 360 365

Asn Gln Leu Ser Gly Ser Ala Arg Ser Ser Val Ile Tyr Gly Lys Ile
370 375 380

Leu Ser Ile Leu Ser Glu Leu Arg Thr Leu Gly Met Gln Asn Ser Asn
385 390 395 400

Met Cys Ile Ser Leu Lys Leu Lys Asn Arg Lys Leu Pro Pro Phe Leu
405 410 415

Glu Glu Ile Trp Asp Val Ala Asp Met Ser His Thr Gln Pro Pro Pro
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Ile Leu Glu Ser Pro Thr Asn Leu
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<210> 72
<211> 943
<212> DNA
<213> Renilla

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cgacatgttg tgccacatat tgagccagta gcgcggtgta ttataccaga cttattgggt 240
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| | |
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| gcataatcttg aaccattcaa agagaaaggt gaagttcgtc gtccaacatt atcatggcct | 660 |
| cgtgaaatcc cgtagtaaa aggtggtaaa cctgacgttg taaaaattgt taggaattat | 720 |
| aatgcttattc tacgtgcaag tgatgattta ccaaaaatgt ttattgaatc ggacccagga | 780 |
| ttctttttcca atgctattgt tgaagggtgcc aagaagtttc ctaatactga atttgtcaaa | 840 |
| gtaaaagggtc ttcatTTTTTc gcaagaagat gcacctgatg aaatgggaaa atatatacaa | 900 |
| tcgttcgttg agcgagttct caaaaatgaa caataattct aga | 943 |

<210> 73
 <211> 530
 <212> DNA
 <213> *Saccharomyces cerevisiae*

| | |
|--|-----|
| <400> 73 | |
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| ctcattgcta tattgaagta cggattagaa gccgccgagc ggggtgacagc cctccgaagg | 120 |
| aagactctcc tccgtgcgtc ctcgtcttca ccggtcgcgt tcctgaaacg cagatgtgcc | 180 |
| tcgcgccgca ctgctccgaa caataaagat tctacaatac tagcttttat ggttatgaag | 240 |
| aggaaaaatt ggcagtaacc tggccccaca aaccttcaaa tgaacgaatc aaattaacaa | 300 |
| ccataggatg ataatgcat tagtttttta gccttatttc tggggtaatt aatcagcgaa | 360 |
| gcatgatttt ttgatctatt aacagatata taaatgcaaa aactgcataa ccactttaac | 420 |
| taatactttc aacattttcg gtttgtatta cttcttattc aaatgtaata aaagtatcaa | 480 |
| caaaaaattg ttaatatacc tctatacttt aacgtcaagg aggaattaag | 530 |

<210> 74
 <211> 3157
 <212> DNA
 <213> *Escherichia coli*

| | |
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| atgggtcggg atctgtacga cgatgacgat aaggtaccta aggatcagct tggagttgat | 120 |
| cccgtcgttt tacaacgtcg tgactgggaa aaccctggcg ttaccaact taatcgcctt | 180 |
| gcagcacatc cccctttcgc cagctggcgt aatagcgaag aggcccgac cgatcgcctt | 240 |
| tcccaacagt tgcgcagcct gaatggcgaa tggcgctttg cctggtttcc ggcaccagaa | 300 |
| gcggtgccgg aaagctggct ggagtgcgat cttcctgagg ccgatactgt cgtcgtcccc | 360 |
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| acggtcaatc cgccgtttgt tcccacggag aatccgacgg gttgttactc gctcacatct | 480 |
| aatgttgatg aaagctggct acaggaaggc cagacgcgaa ttatttttga tggcgtaaac | 540 |
| tcggcgtttc atctgtggtg caacgggcgc tgggtcggtt acggccagga cagtcgtttg | 600 |

| | |
|--|------|
| ccgtctgaat ttgacctgag cgcattttta cgcgccggag aaaaccgcct cgcggtgatg | 660 |
| gtgctgcgtt ggagtgacgg cagttatctg gaagatcagg atatgtggcg gatgagcggc | 720 |
| attttccgtg acgtctcgtt gctgcataaa ccgactacac aaatcagcga tttccatggt | 780 |
| gccactcgct ttaatgatga tttcagccgc gctgtactgg aggctgaagt tcagatgtgc | 840 |
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| ctctatcgtg cggtggttga actgcacacc gccgacggca cgctgattga agcagaagcc | 1080 |
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| ccgttgctga ttcgaggcgt taaccgtcac gagcatcatc ctctgcatgg tcaggtcatg | 1200 |
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| cgctgttcgc attatccgaa ccatccgctg tggtagacgc tgtgcgaccg ctacggcctg | 1320 |
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| tttgccgacc gcacgccgca tccagcgctg acggaagcaa aacaccagca gcagtttttc | 1980 |
| cagttccgtt tatccgggca aaccatcgaa gtgaccagcg aatacctgtt ccgtcatagc | 2040 |
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| ccggagagcg ccgggcaact ctggctcaca gtacgcgtag tgcaaccgaa cgcgaccgca | 2220 |
| tggtcagaag ccgggcacat cagcgcctgg cagcagtggc gtctggcgga aaacctcagt | 2280 |
| gtgacgctcc ccgccgcgtc ccacgccatc ccgcatctga ccaccagcga aatggatttt | 2340 |
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| atgtggattg gcgataaaaa acaactgctg acgccgctgc gcgatcagtt caccctgca | 2460 |
| ccgctggata acgacattgg cgtaagtga gcgacccgca ttgaccctaa cgcctggggtc | 2520 |

| | |
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| ggtttccata tggggattgg tggcgacgac tcttggagcc cgtcagtatc ggcggaatta | 3120 |
| cagctgagcg ccggtcgcta ccattaccag ttggtct | 3157 |

<210> 75
 <211> 185
 <212> DNA
 <213> Escherichia coli

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| cagtactgct gtatataaaa ccagtggta tatgtacagt acgtcgactg ctgtatataa | 120 |
| aaccagtgggt tatatgtaca gtactgctgt atataaaacc agtgggtata tgtacagtac | 180 |
| gtcga | 185 |

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15